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TRANSFERABLE QUOTAS UNDER THE MAGNUSON ACT

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Transferable Quotas Under the Magnu...

HEARING

BEFORE THE

SUBCOMMITTEE ON FISHERIES MANAGEMENT

OF THE

COMMITTEE ON
MERCHANT MARINE AND FISHERIES
HOUSE OF REPRESENTATIVES

ONE HUNDRED THIRD CONGRESS

FIRST SESSION

ON

THE USE OF INDIVIDUAL TRANSFERABLE QUOTAS IN WHICH INDIVIDUAL FISHERMEN ARE ALLOCATED FIXED QUOTA SHARES WHICH ENTITLE THEM TO CATCH A PERCENTAGE OF THE TOTAL ALLOWABLE CATCH

FEBRUARY 9, 1994

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TRANSFERABLE QUOTAS UNDER THE MAGNUSON ACT

WEDNESDAY, FEBRUARY 9, 1994

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON FISHERIES MANAGEMENT,
COMMITTEE ON MERCHANT MARINE AND FISHERIES,
Washington, DC.

The Subcommittee met, pursuant to call, at 1:43 p.m., in room 1334, Longworth House Office Building, Hon. Thomas J. Manton [chairman of the Subcommittee] presiding.

Present: Representatives Manton, Hughes, Unsoeld, Taylor, Lancaster, Hamburg, Cantwell, Pallone, Young, Coble, Kingston, Torkildsen, Furse, Reed, and Gilchrest.

Staff Present: Jeffrey Pike, Chief of Staff; Tom Kitsos, Chief Counsel; Sue Waldron, Press Secretary; Jim Mathews, Staff Director; Greg Lambert and Dave Hoskins, Counsel; Lori Rosa and Randy Morris, Clerks; Jean Flemma, Frank Lockhart, and Bill Wright, Professional Staff; Harry Burroughs, Minority Staff Director; Rod Moore, Dave Whaley, Margherita Woods, Ed Lee, and John Rayfield, Minority Professional Staff; and Bonnie Bruce and Amy Santin, Sea Grant Fellows.

OPENING STATEMENT OF HON. THOMAS J. MANTON, A U.S. REPRESENTATIVE FROM NEW YORK, AND CHAIRMAN, SUBCOMMITTEE ON FISHERIES MANAGEMENT

Mr. MANTON. Good afternoon, ladies and gentlemen, members of the Subcommittee. We will get started. We are now nearing the end of our series of hearings on the Magnuson Act legislation so vital to protecting U.S. fisheries and ensuring their future viability.

Today, the Committee will hear testimony on the use of individual transferable quotas or ITQs. While the Magnuson Act is silent on the use of ITQs, numerous fisheries management councils are considering their use as a management tool. The ITQ system is a limited entry management regime in which individual fishermen are allocated fixed quota shares which entitle them to catch a percentage of the total allowable catch, also known as the TAC, of a given fishery.

The fishermen are then free to sell, lease, or otherwise transfer these shares as they see fit. The goal of this type of management regime is to reduce overcapitalization by giving fishermen a guaranteed proportion of the TAC and, in effect, freezing new entrants out of the fishery. Apparent benefits are that ITQs allow fishermen to fish at their own pace and in a more efficient manner.

The use of ITQs is a relatively new tool in fisheries management. While some in the industry support the use of ITQs as an innovative management device, many others point out potential problems with their use. ITQ plans may be more expensive and difficult to enforce than other management plans, and they may allow one or a limited number of individuals to exercise unreasonable control over the market for a fishery. In addition, there are serious questions as to the nature of the rights an ITQ holder is being granted.

Currently, ITQ systems have been established for three different U.S. fisheries. These fisheries are a valuable source of information to examine both the positive aspects of ITQ regimes and the concerns which have arisen regarding this form of fisheries management. They can provide some needed guidance in determining whether the use of ITQs will provide an efficient and fair mechanism to conserve and manage our fishery resources.

There are many questions which remain to be answered regarding ITQs. We will hear a wide range of views today which will address the concerns of opponents as well as the disagreements among proponents as to how, where, and when ITQs should be implemented. I am anxious to hear what our witnesses have to say. The Chair now recognizes Mr. Young, the ranking member, for an opening statement.

STATEMENT OF HON. DON YOUNG, A U.S. REPRESENTATIVE FROM ALASKA, AND RANKING MINORITY MEMBER, SUBCOMMITTEE ON FISHERIES MANAGEMENT

Mr. YOUNG. Thank you, Mr. Chairman. Mr. Chairman, I ask unanimous consent at this time to submit for the record the statement of the Honorable Jack Fields, Republican from Texas.

Mr. MANTON. Without objection, so ordered.

[Statement of Mr. Fields follows:]

STATEMENT OF HON. JACK FIELDS, A U.S. REPRESENTATIVE FROM TEXAS, AND RANKING MINORITY MEMBER, COMMITTEE ON MERCHANT MARINE AND FISHERIES

Mr. Chairman, I appreciate your holding this hearing on one of the controversial aspects of the reauthorization of the Magnuson Fishery Conservation and Management Act. This hearing is one of the last in a series of hearings in this reauthorization process, and I look forward to working with the Chairman on developing legislation in the near future.

Today we will hear testimony on the effectiveness of the Individual Transferable Quota (ITQ) system as a conversion and management tool. I believe there is still a lot to be learned about this system, specifically whether ITQ's can be workable in all fisheries. I am curious to learn from fishermen today whether this system is a better management tool than an open access fishery with other conservation restrictions in place.

I understand that the ITQ system has been established in several fisheries, yet I also understand that the jury is still out on its effectiveness in certain aspects of fisheries management. I realize that such a system can be beneficial in making commercial fishing safer by lengthening the fishing season rather than managing a fishery with a "derby" style season. However, I wonder whether additional management techniques may be needed to address concerns such as bycatch or high-grading, which may not be improved with an ITQ system.

I look forward to hearing the views of our witnesses on how the current ITQ systems are working, and whether such a system could work as a management tool in other fisheries.

Thank you, Mr. Chairman.

Mr. YOUNG. Mr. Chairman, I thank you for having these hearings today, and I know there is a great deal of lack of knowledge

of the ITQs. This is one issue though that I do believe I know a little bit about. In the 1970's, fishermen in my State debated whether to establish a limited entry program for the salmon fisheries. Twenty years later, we have the limited entry. We have a lot of fish but not necessarily because of the limited entry. We have a small class of instant moneymakers, and we have a lot of people who are going bankrupt.

Most recently, the North Pacific Fishery Management Council decided to impose an ITQ system on halibut and sablefish fisheries. The National Marine Fisheries Service estimates that, at the very minimum, enforcement and implementation of this system will cost about $3.5 million. Knowing the Federal Government, the cost will probably be much higher, and we have not decided yet where that money is going to come from.

I often wonder where we will be 20 years from now. Will we have stable fishery and prosperous coastal communities or will everybody be going bankrupt?

And as the members see from the testimony, ITQ plans are not simple, nor are they cheap. They can help some fishermen, and they can hurt a lot of others. Unfortunately, the National Marine Fisheries Service has decided that ITQ plans are the way to go and are now pushing for them in many other fisheries. I think we ought to really look very carefully because we created the Magnuson Act which gave the councils the authority to do so—very carefully the effect the ITQ has not only on the communities but the possibilities of the ITQs creating a monstrous monopoly in the fishing industry, and I do thank you for having these hearings, Mr. Chairman.

Mr. MANTON. The Chair will now recognize Mr. Hughes for an opening statement.

STATEMENT OF HON. WILLIAM J. HUGHES, A U.S. REPRESENTATIVE FROM NEW JERSEY

Mr. HUGHES. Thank you, Mr. Chairman. First of all, let me congratulate you on convening these hearings. I think they are very appropriate, and as we look at new ideas and how we can better manage our fishery resources, I think this is a very good starting point, and I congratulate you on that.

Mr. Chairman, we are examining today alternative tools for fishery management and, in particular, individual transferable quotas or ITQs. And as we prepare to reauthorize the Magnuson Act, it is appropriate that we reassess our current management strategies and look to innovative ways to try to do a better job. I don't think that is any criticism on present management policies, but we can always do better. I think most will agree with that.

The proposal in question is not new to my area. We have had as an example of an ITQ system in place, the one that we apply to surf clam and to ocean quahog along the East Coast. And I might say that we have had mixed results. There are a lot of problems that that has created, and I hope we can benefit from that experience. I hope as we pursue these alternative means to better manage our fishery resources, we will look at both the strengths as well as the weaknesses of that initiative.

I don't think there is any question that in order for an ITQ to work it needs stability and it needs some degree of predictability

much like the monetary system. If, in fact, you are going to save, you want to make sure that you are going to be able to turn it in in 5 years, and that is what makes our system in the United States so good and attractive to the world—is because it is stable, and it is predictable.

We also need to make sure that we don't create virtual quota monopolies throughout this country, and that is something I think that we need to be concerned about. And I think we need to look at this particular management tool on a fishery-by-fishery basis. What may be good for clam and quahog is not necessarily good for a fluke fishery. I think that is important.

And, finally, let me just tell you that I am just delighted to help you welcome our Assistant Administrator, Rollie Schmitten, who already has done a magnificent job. He has been around the country. I don't know how many States he has traveled to—17 or 18 perhaps. But he was in New Jersey, and I want to tell you he is a miracle worker because he actually had people from the recreational fishery and the commercial fishery saying nice things about him and even talking to one another which demonstrates to me that he is off to a good start, and we look forward to many more occasions when we can welcome you and work with you on this and other matters. I look forward to hearing the other witnesses before this hearing today. It is a good hearing that you have structured, Mr. Chairman, and, again, I congratulate you.

[Statement of Mr. Hughes follows:]

STATEMENT OF HON. WILLIAM J. HUGHES, A U.S. REPRESENTATIVE FROM NEW JERSEY

Thank you, Chairman Manton, for convening this hearing on the use of individual transferable quotas—or ITQ's—as a fisheries management tool.

This is an important issue we are addressing today. Alternative tools for a fishery management may or may not hold the key to sustainable development of our nation's fisheries. As we prepare to reauthorize the Magnuson Fisheries Conservation and Management Act, it is vital that we reassess our current management strategies and look at new ideas and new ways to manage our fisheries. This is not to say that our current management scheme is bad or that other alternatives are better. But it is important that we not fall into the trap of believing that our current management practices are the be-all and end-all of the evolution of fisheries management. I am sure—and I doubt that anyone in this room will disagree—that we can do better. We can better conserve our resources and we can make our management system more user-friendly for industry.

The question of course, is how? How do we go about improving our management practices?

One proposal—the one which we are examining today—involves the use of an ITQ system. Under an ITQ system, fisheries management scientists and officials would establish a total allowable catch, but then they would in turn be allocated to a specific number of fishermen in a closed-access system. These ITQ's could be utilized by the owner, transferred, sold, leased or rented.

There seem to be many advantages and disadvantages to an ITQ system. One advantage is that it may reduce incentives for overfishing. Another possible advantage is the end of management practices that have often forced fishermen to go out in bad weather to try to harvest their share of the catch. Many of us have lost constituents that way and there is certainly an advantage to a system that ends incentives to fish in bad weather.

However, there seem to be disadvantages to this system, too. Implementation of an ITQ system in a given fishery is likely to cause a major disruption in that fishery. Enforcement is also likely to be a problem, since vessels would be fishing year round rather than seasonally.

Of course, we already have an example of an ITQ system to examine in the surf clam and ocean quahog fishery along the East Coast. I already have concerns about the operation of this particular ITQ system and I will be directing questions to some

of the witnesses later on this matter. For now, let me lay out some of the general concerns that I believe need to be addressed before we begin implementing more ITQ systems.

First, in order to work effectively, an ITQ system needs stability and a degree of predictability. An ITQ system is very similar to our monetary system. Like the monetary system, in order for an ITQ system to work, participants in the system must have faith in the rules of the game and the underlying value of their quotas. If you were told that the money that you have in your wallet today couldn't be used tomorrow, how would you react? Fishermen and processors purchasing ITQ's must know that the rules of the game won't change on them. We must assure them that if we give them a 5-year ITQ or they purchase one from someone else, that 2 or 3 years down the line, we won't go back to an open system without ITQ's. We must take steps to ensure the value of the ITQ's in such a system.

We also need to examine the potential for the creation of quota monopolies and the effect that might have on our fisheries. That situation, in turn, is part of a bigger question, which is: What effect will an ITQ system have on the traditional way of life of the fisherman? What value do we as a culture place on our fishermen and the traditions surrounding the fishing industry? We need to look closely at this because implementation of an ITQ system would probably cause our fishing fleets to shrink and change the relationships between fishermen, vessel owners, processors, and others in the industry.

I think it is also important that we look at new management schemes on a fishery-by-fishery basis. What may be good or bad for the surf clam and ocean quahog fishery, may have a completely different effect upon the fluke fishery or the management of highly migratory species such as the swordfish.

Finally, I would like to express my appreciation to the witnesses who have come to testify before us today. I am particularly pleased to see NMFS administrator Rollie Schmitten here before us on this matter. I have heard nothing but encouraging words about you, Mr. Schmitten, from the many New Jersey fishermen and industry representatives who met with you last month in northern New Jersey. Those kind words came from both commercial and recreational fishermen—and to solicit praise from both groups is no mean feat. I look forward to working with you and meeting you on a one-to-one basis in the future.

I am glad, too, that Chairman Lee Anderson of the Mid-Atlantic Council is here to give his insight into the potentials of ITQ-based management.

I'm also pleased to see that Roger McManus of the Center for Marine Conservation is here today, as well as several industry representatives, including Mr. Dave Wallace, who is representing a consortium of clam processors and fleet operators—many of which are based in my district.

I would ask that my colleagues, Administrator Schmitten, Chairman Anderson, and others, pay special attention to Mr. Wallace's testimony. I have examined his written testimony and know that he will raise a number of concerns that I share with the consortium.

In particular, I share their concern over amendment 9 to the surf clam and ocean quahog plan which would place control of the ocean quahog fishery located in Federal waters off the State of Maine under the control of that State. I am pleased that the Mid-Atlantic Council rejected that proposal because I believe it is not only unfair, but that it could undermine the whole ITQ system by creating an exception to the rules of the trade as established in amendment 8 and the Magnuson Act in general.

Mr. Wallace will also raise serious questions about the penalty system that was recently revised by NOAA to include allocation sanctions. While I support strong penalties for violators as a deterrent, I share the industry's concern that allocation sanctions as they are currently included in the penalty schedule could have a dire effect on the smaller processors who contract with independent fishermen to harvest their allocations. I am also concerned that the fear of these sanctions together with other uncertainties associated with the value of ITQ's is causing banks to stop extending credit for the purchase of ITQ's.

I have a number of questions along these lines to pose to Administrator Schmitten which I will reserve for later. At this time, though, I would like to thank the Chairman again and yield back the floor.

Mr. MANTON. The Chair recognizes Mr. Kingston. You waive an opening statement? The Chair will now recognize Mrs. Unsoeld.

STATEMENT OF HON. JOLENE UNSOELD, A U.S. REPRESENTATIVE FROM WASHINGTON

Mrs. UNSOELD. Thank you, Mr. Chairman. I just want to thank you for doing this. This is an issue that merits our attention, and it is not going to be easy. I also want to welcome Mr. Schmitten with whom I have had a "little" past experience, and I really do welcome him to appear in this capacity before the Committee. I would like to yield the rest of my time to all of the witnesses that you have assembled because there is much we should learn from them.

Mr. MANTON. Thank you. The Chair would like to point out that Ms. Furse is here and will be given time to speak even though she is not a member of this Subcommittee, and we will get to her in due time. Mr. Hamburg from California.

STATEMENT OF HON. DAN HAMBURG, A U.S. REPRESENTATIVE FROM CALIFORNIA

Mr. HAMBURG. Thank you, Mr. Chairman. I have a short opening statement that I would like to submit for the record. But I want to also thank you for holding this hearing and say that in the salmon fishery on the north coast of California the major concern is how ITQs would be used. And I have a lot of small family-owned fisheries. There is a lot of concern that if ITQs are managed through the management councils that perhaps it will be the larger fishing concerns that benefit, and the small family-owned operations like the ones that are in my district and I represent may end up on the losing end.

So the really important thing here is how an ITQ system is implemented. It seems to me that there needs to be some kind of national strategy that is determined and that we not merely leave local management councils adrift on this issue. And I think this could be a creative solution and creative tool, but I think it depends on how we shape it in this Magnuson Act reauthorization. Thank you, Mr. Chairman.

[Statement of Mr. Hamburg follows:]

STATEMENT OF HON. DAN HAMBURG, A U.S. REPRESENTATIVE FROM CALIFORNIA

Good afternoon, Mr. Chairman and colleagues:

Thank you for convening this hearing to address the issue of Individual Transferable Quotas.

I'm a firm believer that before you set foot on any path, you have to know what you want and where you are going. I question whether there has yet been any clear definition of what we hope to achieve in our fisheries with ITQs; whether there has yet been sufficient evaluation as to how ITQ programs will be devised and implemented.

Much of the fishing industry in the first district of California is composed of small family-run businesses. They fear the danger of domination by large corporations through ITQs; they fear losing their businesses and their independence. They are concerned that if the Fishery Management Council process is used to define and structure an ITQ system there will not be sufficient consideration for the needs of the entire fishing community; that those interests which dominate the Councils will prevail.

As we consider broadening the use of ITQs in our fisheries, we must avoid any inclination to proceed haphazardly. We must clearly examine, for example, whether we should devise a mechanism for management of ITQs which would address the need for consistent guidance at the national level, while providing a fair and equitable process at the local level.

As we strive to identify creative solutions to manage our troubled fisheries, ITQs can be one tool among many, but we must be very careful to look before we step.

Mr. MANTON. The Chair recognizes Ms. Cantwell from Washington State.

STATEMENT OF HON. MARIA CANTWELL, A U.S. REPRESENTATIVE FROM WASHINGTON

Ms. CANTWELL. Thank you, Mr. Chairman. I want to commend you for continuing to hold these hearings on the Magnuson Act. Mr. Chairman and members of the Committee, I can't overemphasize the importance of the Magnuson Act to my district in the State of Washington. Of late, the most dramatic impacts have been bankruptcies which for the Northwest-based fleet have been all too common an occurrence. In the second half of 1993 alone, four factory trawler vessels filed for bankruptcy, and more vessels will follow suit this year.

We have seen continued reductions in crew sizes and actual fishing jobs as companies deal with shortened seasons and limited access. The direct impact of government policies is felt immediately by the industry while indirect repercussions extend well beyond the fishing industry, to a range of secondary businesses which will be dramatically affected if this current trend continues.

A significant sector of the Northwest economy depends on a healthy fishing industry. I will listen in earnest today to the debates on whether the ITQ management concepts will enable us to solve some of these problems or actually cause unexpected consequences that may provide more difficulties.

It is very critical that we act this year on the reauthorization of the Magnuson Act and resolve some of these issues. If we continue to delay for another year the reauthorization of the Act, we will be dealing with an even smaller factory trawler industry in the Puget Sound area.

Mr. Chairman, as the Committee moves toward developing a comprehensive bill, I look forward to working closely with you and other committee members to bring a strong bill to the floor of the House as soon as possible.

Mr. MANTON. Rotating to the other side of the aisle, Mr. Torkildsen from the State of Massachusetts.

STATEMENT OF HON. PETER TORKILDSEN, A U.S. REPRESENTATIVE FROM MASSACHUSETTS

Mr. TORKILDSEN. Thank you, Mr. Chairman. I too want to add my support for reauthorizing Magnuson, obviously with some needed changes. And for brevity, I would just like to submit a statement into the record.

[Statement of Mr. Torkildsen follows:]

STATEMENT OF HON. PETER G. TORKILDSEN, A U.S. REPRESENTATIVE FROM MASSACHUSETTS

As the Member of Congress from the district which includes the largest port (in tonnage) on the eastern seaboard, I wish to express my strong support for reauthorization of the Magnuson Act. Since 1976, the Magnuson Act has provided for the protection of fisheries resources both for the benefit of the environment and for the fishermen whose livelihood depends on replenishing fish stocks.

We do have the opportunity to improve the Magnuson Act by requiring the use of information from fishermen themselves and the best scientific data available if a fishery is under consideration for closure or restriction.

We must also ensure more open and timely communication between the regional councils and fishermen. These and other changes must be made to allow the Magnuson Act to continue to function as it was intended.

By improving the Magnuson Act, we can see that depleted fish stocks are replenished, and that fishing families can continue to make a living from fishing as they have for centuries.

Mr. MANTON. Thank you. And the Chair recognizes Ms. Furse from the State of Oregon.

STATEMENT OF HON. ELIZABETH FURSE, A U.S. REPRESENTATIVE FROM OREGON

Ms. FURSE. Thank you so much, Mr. Chairman, for allowing me to testify. I do have a longer statement I would like to submit for the record but a couple of things I would like to say.

First of all, as you know, ocean fisheries are the lifeblood of my community, the First District of Oregon, and this is, therefore, a very timely hearing, Mr. Chairman. I do want to commend you for focusing attention on this important issue.

We need to be both thorough and critical in our examination of ITQs to ensure that we do not inadvertently create as many new problems as we intend to solve. In particular, I believe we need to ensure that through ITQs we do not concentrate the right to fish in the hands of a wealthy elite. It is especially important that we do not write coastal communities and small local resource harvesters out of the economic picture. As the Northwest communities struggle to make the transition away from being timber-dependent communities, it is very important we take advantage of other opportunities for economic diversification and job creation.

In closing, Mr. Chairman, I would like to bring my colleagues' attention to an additional piece of written testimony that has been added to your folders. It is from a constituent of mine, a Mr. Frank Dulcich. He has submitted this on behalf of the Pacific Processors Association. This Association represents all the major seafood processors in Washington, Oregon, and northern California including some 40 processing plants that employ nearly 10,000 Northwest workers. He was not able to submit that today in person, but I would like to ask that you take a good look at his short statement.

Mr. MANTON. Without objection, we will make it part of the record.

[Statement of Mr. Dulcich can be found at the end of the hearing.]

Ms. FURSE. Thank you, Mr. Chairman.

Mr. MANTON. Now, our first witness is Mr. Rolland or Rollie Schmitten, Assistant Administrator for Fisheries. I would like to say that Mr. Schmitten has also visited the New York area and met with many of the participants in the industry and the recreational fishing community. And, we even had a nice dinner one night in an Italian restaurant in my district, and we talked a lot of business, and some folks drank a lot of wine, but everybody was clear-headed. I want to thank you, Rollie, for agreeing to attend today's hearing. I look forward to your testimony.

However, before we begin, I would like to make a brief comment about a fisheries matter which is not before the Subcommittee today. Apparently, the French Government has succumbed to the violent and illegal demonstrations of a group of its fishermen protesting foreign imports. The most recent information I have seen indicates the French are holding all fish imports at their port of entry and threatening to impose a total embargo on foreign fish and fish products, thus threatening a huge economic loss for U.S. interests and other exporters.

I believe this decision is unfair and unjustified, and I call upon the French Government to reconsider this ill-advised action. I am also calling upon the Administration, specifically, the U.S. Trade Office, to begin work immediately to resolve this crisis. I know we can count on you, Rollie, and NMFS to work with us in protecting U.S. fishery interests. With that said, we will begin today's hearing.

STATEMENT OF ROLLAND A. SCHMITTEN, ASSISTANT ADMINISTRATOR FOR FISHERIES, NATIONAL MARINE FISHERIES SERVICE, NOAA

Mr. SCHMITTEN. Thank you very much, Mr. Chairman. I certainly hope I can live up to all the expectations that you have bestowed upon me. I have visited 19 States in the last 90 days. My attempt is to visit with your fishermen, learn their needs, and come back and then meet with you to discuss those needs. It is a complete reversal from where the agency has been in the past.

Mr. Chairman and members of the Subcommittee, as the record shows, my name is Rollie Schmitten. I am the Assistant Administrator for Fisheries for the National Marine Fisheries Service. We are a part of the National Oceanic and Atmospheric Administration (NOAA). It is indeed a privilege and pleasure to testify before this Subcommittee, and I would note that it is my first opportunity to be before you as the Director of the National Marine Fisheries Service.

I appreciate the opportunity to present the agency's views on a very important topic, Individual Transferable Quotas, ITQs. I have submitted a very lengthy written set of comments but will summarize the major points in my testimony this afternoon in the brevity of time.

First, I want to emphasize that I view ITQs as one of several available tools for use in the management and conservation of our national fisheries. Should the affected fishing communities seek to explore ITQs, the regional councils are the appropriate bodies and not the Federal Government to determine whether an ITQ program is appropriate for a specific fishery. Should the council determine that an ITQ-type program is desirable, government does have an obligation, and it should lend its full support and its technical expertise to ensure that any such program would conserve the nation's fisheries, address the needs of the fishing industry, and meet the fair and equitable standards as well as producing benefits for the nation.

ITQ management certainly has many positive features, and we should support their use for certain fisheries, but they should not be viewed as a one-size-fits-all tool. Our position is that limited ac-

cess and ITQ programs should work from the bottom up and not from government down. The cost of implementing, administrating, monitoring and enforcing ITQ programs is significant. You know, such costs, potentially several million dollars a year, cannot, and I would add should not, be absorbed by the Federal Government or the public that we serve. To this end, the agency is reviewing proposals which would consider the recovery of these costs from the groups that receive the benefits from specific ITQ programs.

Simply put, ITQs are a management concept wherein fishermen are assigned negotiable shares, and these are not vested rights, of the total allowable catch of specific fish stocks. ITQs can be traded in free and competitive markets. ITQs are not new. Other countries of the world, notably Canada, New Zealand, Iceland, currently employ them, and new programs are being implemented at an increasing rate. However, the adoption of an ITQ program represents a dramatic and fundamental change in U.S. fisheries management. As pointed out earlier, our first ITQ program was introduced in 1991 with the adoption of the surf clam and quahog ITQ.

Development and implementation of limited access programs or ITQs pose significant challenges to the councils as well as to the National Marine Fisheries Service. Our immediate challenge is to assist the councils in designing fair and equitable systems that are understood by all interested parties.

There are a number of reasons fishermen and the councils might consider an ITQ system. On the face of it, an ITQ program would allow fishermen to use the most efficient, effective method and times to harvest their share of allowable catch and thereby reducing the race for fish. Other benefits can include increased safety, reduced gear loss, increased value, higher-quality products, improved availability in the marketplace, and reduced bycatch.

The economic benefits of using ITQs to allocate fishing privileges include certainly the facilitation of entry and exit from fisheries, fostering economic efficiencies, creating economic wealth, as well as potential future reduction in the cost of management of fisheries.

To some degree, the council and NMFS management burdens would be or could be offset or reduced. We anticipate significant reductions in the micromanagement that we currently see in our fisheries throughout the West Coast and East Coast compared to the levels required under the current management programs.

One important issue is whether ITQs grant actual property rights to participants. In general, ITQs can be viewed as transferring harvesting privileges to a public resource rather than actual property rights. Both the councils and the regulations reflect this. These harvesting rights can be withdrawn depending upon the design of the ITQ program. For example, an ITQ program could be sunsetted just as much legislation is sunsetted after a specific period of time. Mr. Chairman, if you would like, I would summarize.

Mr. MANTON. Go right ahead.

Mr. SCHMITTEN. There are also several factors that must be recognized and resolved before implementing ITQ programs. These are the downsides. Those include certainly setting the initial allocations, the start-up cost, as well as the need for redirected or increased enforcement. The main challenge to the National Marine Fisheries Service, to our scientists, will be to expand the agency's

research and stock-assessment capability so we can increase the predictive quality or the precision, of our stock assessments. Fishermen want to know that the data are accurate.

The human or social element of fisheries management is of particular concern in developing and implementing any ITQ program, and these elements include the recognition of historic and present participation in the fisheries, dependence upon the fisheries, active participation by fishermen in the designation of programs, the issue of fairness, the equity of shared allocation, and the ability to participate in the fisheries in the future.

In addition, we shouldn't ignore the potential effects of ITQs on very small communities such as in Alaska, some of the communities on the East Coast, and, in particular, the Northeast. In such cases, the councils could allow these communities to participate through allocations of community development quotas or CDQs. Each year, a certain percentage of the total quota of a fishery could be set aside as a CDQ which, in turn, would be divided among eligible communities. The example currently before us is in the Alaska groundfish fisheries.

Last, your letter of invitation asked that I address the needs for legislative change. Although the subject is currently under consideration by a joint congressional, industry and government working group, I would highlight the need for legislative change which would provide the agency with the authority to assess fees to support the management, and the means to effectively implement, administer, and enforce these programs. Such fees could support necessary programs such as increased monitoring systems for tracking ownership, and, as I said, improved enforcement.

In conclusion, ITQ programs can be very useful tools to conserve and to manage a nation's fisheries resources although they are not a panacea. They do not represent one approach that can address many of the problems that have developed under the traditional open-access management program. As someone mentioned, not every fishery is the same, nor should the same management program be applied to every fishery. As I noted, there are significant costs involved in developing, implementing, and maintaining these programs.

In fisheries with well-designed ITQ programs, I believe that over time the benefits certainly outweigh the costs. Nevertheless, it is not our intent as an agency to force such systems on anyone. As I pointed out earlier, if the affected fishing industry does not desire and will not support such a system, the system very likely would fail. I think it is important that I clarify that as an agency position. On the other hand, it is my hope that through better understanding and example, the benefits derived through an ITQ system as applied to fisheries "where the shoe fits" will lead to increased industry support.

Mr. Chairman, I thank you very much for the opportunity. That concludes my testimony or my summary, and I would be very pleased to attempt any questions.

[Statement of Mr. Schmitten can be found at the end of the hearing.]

Mr. MANTON. Thank you, Mr. Schmitten. I have a few questions, and then we will open it up to the other members of the panel. Did you say the certificates of quota would not be vested?

Mr. SCHMITTEN. Yes. Mr. Chairman.

Mr. MANTON. Explain that a little bit.

Mr. SCHMITTEN [continuing]. ITQs are a harvesting privilege. It is not a vested right. And this is an important distinction, and each one of the council plans has noted this as well as the regulations. They are not held in perpetuity. I think it is paramount that the resource remains in the public domain.

Mr. MANTON. And is there any time limit? You talked about sunsetting. Assuming I were issued a certificate that would permit me to take a certain quota of the harvest today, how long do I have that privilege? Is it limited? Is it assignable?

Mr. SCHMITTEN. Mr. Chairman, it varies plan by plan. Currently, the two plans on the East Coast are not limited, and, yes, they are assignable. They can be exchanged, leased, or bartered.

Mr. MANTON. Can you hypothecate or pledge your certificate in order to get financing? Is it that kind of an asset? Can I go to the bank to take out a loan to buy a new boat and, when they want to know what my collateral is, say I have a certificate that entitles me to a certain fisheries quota? Does it have value?

Mr. SCHMITTEN. Mr. Chairman, on that issue, over time I am unsure of their use. Let me get a legal answer on that and provide that to the Committee. I have been told that they are, but let us get a proper answer for the Committee. Practice has shown that, although many lending institutions apparently will not lend the value of the ITQs with the ITQs as sole collateral, some lending institutions will make loans with ITQs being part of the total collateral package.

Mr. MANTON. OK, I am probably thinking too much like a lawyer today. How about concentration? You know, when I was on the Banking Committee, we often talked about concentration—what is too much concentration in the hands of one institution. Should we deal with that issue under an ITQ system or leave that to the councils?

Mr. SCHMITTEN. Mr. Chairman, this is a major concern for the fishing communities that have thought about or looked at ITQs, and especially those where they have small fisheries such as Mr. Hamburg has indicated. Will this lead to corporate fishing? The two fisheries on the East Coast have been reduced by about half, but certainly ITQs are designed to reduce overcapitalization and bring down the fisheries but how much is a concern. The Alaska approach was to address that forthright, and they indicated that no more than 1 percent of sablefish and the sablefish and halibut fishery could be owned by one person. And so it would depend on council by council, but I do believe that needs to be addressed—to address the concern of the mom-and-dad, small fisher.

Mr. MANTON. Now, assuming that we think ITQs are a good idea or a good management tool, should we establish by way of legislation the four corners of what the authority would be for the council, or should we just leave it carte blanche to each council to determine what the limits are or what the details are for each particular fishery?

Mr. SCHMITTEN. I will have to give you a personal philosophy, and I happen to believe that throughout the regions they know the intimate details, the needs of their fishers, and I have trust in the regional councils. I do think that there is an obligation of government to make sure on the issues of the national standards, the fairness and equity, that we play a role, we provide guidance.

And on the issue of social and economic data, we make sure that accurate assessments are provided to the councils so when they face a most difficult question, such as the issue of allocation, decisions are made with the best available information. I would prefer to leave it to the councils with the oversight as we have it now, unless we find that the system is broken.

Mr. MANTON. The NOAA strategic plan of July 15, 1993, discusses ITQs extensively, and some feel that NMFS promotes ITQs above all other management alternatives. Can you comment on that?

Mr. SCHMITTEN. Mr. Chairman, I think rather than a change, what I have provided is certainly a clarification. In my visits up and down the Eastern Seaboard and in the Gulf, there have been 14 States. It is clear that the fishing community believes that limited access and ITQs are being imposed by my agency. It is my opinion that this view and the fear of government are undercutting the possible use or further consideration of ITQs. It is imperative that we provide the opportunity, but the proposal must come from the fishing community. If it senses the government wants to impose this, it simply is going to be a gridlock, and that is where we are with many of the communities.

Mr. MANTON. Now, my last question, does NMFS currently have adequate funds to support ITQ programs?

Mr. SCHMITTEN. This is where I have grave concern. Yes, we have adequate funds for 1994 for the two small ITQ systems that we have on the East Coast, and for the start-up costs, we have $1.2 million in our base for the Alaska system, which is not to come on line until March of 1995. The Alaska system, as was indicated earlier, is expected to exceed $3 million annually. It is our view, and we will propose legislative changes, that those that benefit from the national resource should pay for that privilege, that we need to assess that amount from the industry, and we need to use those revenues for administrative and enforcement costs.

Mr. MANTON. You wouldn't use it as a revenue measure? Just to support the enforcement cost?

Mr. SCHMITTEN. For the proposal here, yes. We have other proposals that we will discuss before the Committee. But for the ITQ, it would be just for the cost.

Mr. MANTON. Thank you, Mr. Schmitten. That concludes my round, and I will recognize the ranking member, Mr. Young, for questions.

Mr. YOUNG. Thank you, Mr. Chairman, and, Rollie, I appreciate your testimony. The one thing that concerns me is, as the Chairman brought up, the control of the fisheries. You know, Alaska passed that only 1 percent can be owned by any individual, but that really means 100 people could own the whole thing. And that is one of our big fears as far as communities go and those that have

been involved in the fisheries, and I am hoping that we can address that so it doesn't happen.

But one of the later witnesses makes reference to NOAA's legal decision that has nothing to do with ITQs, but I want to get this on the record too, the decision that quota shares cannot be given to processors because processors are not part of the fishery. However, this Committee has amended the Act to include regulations on processors, and at least one Federal Court case has upheld the Act's ability to regulate the sale on shore on legally caught fish. How do you explain the recent legal decision that NOAA came out and says it can't do that?

Mr. SCHMITTEN. Let me explain the portions I can, and the last legal point, I will ask for legal assistance to get the answer for you. First of all, I think the North Pacific Council should be commended for looking at the needs of the small communities and CDQs and being futuristic about the control of the fisheries. Maybe the 1 percent is off, but at least they were thinking and worrying about that issue.

I know also that there is an examination of the question whether an ITQ system could be used in the processing segment—a separate ITQ, and that is being addressed. If processors own vessels, they may be eligible to receive harvesting ITQs like any other qualifying vessel owner. If they do not own a vessel, they may (depending on the conditions established for ownership) eventually be able to purchase harvesting ITQs, just like any other eligible non-vessel owner. With respect to processing ITQs, as opposed to harvesting ITQs, it is NOAA General Counsel's opinion that only at-sea processors, not land-based processors, are subject to direct allocation of fishing privileges under the Magnuson Act.

Mr. YOUNG. What I am going to suggest is in the first place I have very little confidence in administration or private legal opinions most of the time, especially when they go contrary to what this Committee has written. I do not very easily accept the fact that they think they know better than we do. I think we write the law. They are supposed to interpret the law as we thought it did, and if, in fact, that is upheld, we will write it much clearer next time so we can take care of that problem.

You have already addressed it, but one witness will testify that the ITQs will save the government money and reduce personnel. Yet, NMFS has estimated the halibut that you have already said would cost a minimum of $3.5 million to implement the program, in fact, is already hiring people to do so because without, you know, observing the system, it won't work. Just in your opinion, do ITQs cost the government money and, if so, how and where? And if that is the case, I think you mentioned where do we get the money to do it?

Mr. SCHMITTEN. Congressman Young, in my opinion, in the short-term, ITQs do cost the government more money. We will go through a series of retraining our enforcement people, moving from the traditional, as we know it, on water, dockside enforcement to more of the skilled accounting types. I use the analogy of the IRS type. That will take time, will take cost. So there are short-term costs.

The positive spin on this, though, is that I think the fishermen would welcome a move away from the annual manipulations, the year-by-year time, area, and gear restrictions that we put them through, and so there is an ultimate balance in that. It is our hope, and we have no information to corroborate this, but it is our hope that over the long-term those costs go down, amortize, and, as in my testimony, it will be equal or better under an ITQ system.

Mr. YOUNG. Well, the last thing though, are you going to submit a proposal, or will it be the Council submitting the proposal, or do we have to give the council authority to impose the fees to raise this type money because it is going to be awfully hard——

Mr. SCHMITTEN. Yes.

Mr. YOUNG [continuing]. to get it out of this mess we have got right now in Congress? I can tell you that right now.

Mr. SCHMITTEN. We will submit a proposal that allows the Council to recoup those costs and offset our costs.

Mr. YOUNG. But what I am saying, if, in fact, the Council has to pass the ability to raise the money—I mean, because what if the Council doesn't do it?

Mr. SCHMITTEN. Our proposal will allow us to accrue the fees that offset the cost of the administration.

Mr. YOUNG. All right. I know you are from Washington State, but the last question, Mr. Chairman, I would suggest respectfully you are invited respectfully by myself to come to the great State of Alaska. We are the finest fishing waters of the world. We would like to retain our ownership and not somebody—not other bordering State, but we would at least like to have you come up and talk to our fishermen and find out because this is a very hotly contested tool as you mentioned. Council passed—I would say it is probably split—I am not sure exactly how it was split.

Now, I go to one community, and they hate the thing, and I go to another community, and they sort of like it. I go to another community, and they like it. I would say it is 75/25 against right now so it is going to take a good selling program, and I would like to have you come up.

Mr. SCHMITTEN. Mr. Young, let me guarantee I will do that. In fact, I have scheduled that for May and will work through your staff to make sure we make the right contacts. By the way, I have fished 14 straight years in Alaska. I love it. I wish I could figure out some way to live there, but from a fisherman's perspective, it is paradise.

Mr. YOUNG. Mr. Chairman, one suggestion, Rollie. In about 5 years from now, you might consider coming up. I may be out of this job. You never know.

Mr. MANTON. Mr. Young will be here forever. Mrs. Unsoeld.

Mrs. UNSOELD. Mr. Chairman, thank you. I wanted to make one comment first before asking Mr. Schmitten a question. Because the Act seems clear as interpreted by the NOAA counsel: processors can own ITQs. They just are not eligible for initial allocation because they are not fishermen. And if the report language is going to be used in the manner that has just been described as argument by my colleague, I want to say that I want to go on record in this Committee that I don't want report language to go out on any bill

that hasn't been approved by the Members because we do not vote on the report language. We vote on the legislation.

Mr. YOUNG. Well, you will have a chance to vote on everything, madam.

Mrs. UNSOELD. It is my turn right now. Thank you. I want to address this to Rollie. In your testimony, you suggest that NOAA is not responsible for implementing an ITQ program, and that is consistent with my own view, that the councils are responsible for initiating those management plans. But now what if a council refuses to act? There is a lot of indication that we probably have a majority of the fishermen who support ITQs or some other management method that is going to rationalize a fishery or address problems such as safety. If the council refuses to act, how many more bankruptcies is NOAA prepared to accept before the North Pacific groundfisheries are rationalized?

Mr. SCHMITTEN. In response, NOAA can intervene on issues of conservation representing the Secretary, but I have never heard a debate or even thought that NOAA could intervene to impose allocation. That would likely be most difficult. Where they could intervene is if the allocation is not fully scoped. If a council decides that it wants to go a certain route on an ITQ or a limited entry program and we believe that the scoping should be broader than what is under consideration, we could certainly intervene and let the councils know that, and we would do that.

By the way, I misunderstood the question on the processor too. If they can own ITQs, and I have been told that, yes, they can if they had vessels with a permit, and in some cases processing plants actually own vessels that qualify for permits.

Ms. UNSOELD. I agree with you, but I do think that a moral force is needed to take leadership on this, to help get the council to move forward, and I just don't think that it is appropriate, that it is tolerable to have the issue constantly shunted aside. And in the long run, it will not be good for the fisheries any more than it will be good for the communities that are involved from whatever State. So I do hope that you will exercise the leadership, of which I know you are capable, in this regard so that we do move forward. And I don't know whether you have any comments on what kind of leadership role you feel comfortable playing.

Mr. SCHMITTEN. We will certainly be monitoring even in the development of ITQs because that is when early signals are necessary, not when the determination is simply to turn them down or not, and so we have started the monitoring. Almost all but one council currently are considering some form of limited entry. Many councils, such as the Pacific Council in Mr. Hamburg's district, have decided to go limited-entry, go-slow approach before tackling or looking at an ITQ which has additional ramifications. All but one council is looking at a form of limited entry.

Ms. UNSOELD. One of the related problems that ITQs would have to address is bycatch, and it seems to me that a fee system is going to be necessary to help pay for an adequate cost of observers. I mean, we have potential of enormous cost in order to do the necessary monitoring, but I would hope that you will not just be monitoring these issues but will be nudging them along a little.

Mr. SCHMITTEN. You raise a significant issue that potentially this Committee will want to look at and address. It is more than just the Council's responsibility; it is NOAA's responsibility. I have set aside money to reinvigorate the industry, State, Federal approach to look at bycatch because bycatch is getting ahead of our fishing communities. It is being portrayed as waste, and if we are not careful, it will be used to stop the fishing as we know it now, and we must get ahead of that.

Mrs. UNSOELD. And the last thing I would say is that the fee system should not be used as a punitive tool to move some people out of the fishery. In my view, an equitable distribution of that load I think is necessary.

Mr. SCHMITTEN. I agree with that.

Mrs. UNSOELD. And then let us help on the appropriations cycle because there is going to be a lot for you to do in these matters. Thank you.

Mr. SCHMITTEN. Thank you.

Mrs. UNSOELD. Thank you, Mr. Chairman.

Mr. MANTON. The Chair recognizes Mr. Coble from North Carolina.

Mr. COBLE. Thank you, Mr. Chairman. I am sorry I was late. I had another meeting. I came in just in time to hear from my friend from Alaska and his neighbor to the south. I am sorry I didn't get here earlier for that. I just have one question, Mr. Schmitten. Does a closed-access fishery necessarily mean that overfishing will be reduced?

Mr. SCHMITTEN. No, it does not. In fact, if the allocation or the TAC is set wrong, and that is a matter of the councils and the Federal Government, then you could still have overfishing. So it is imperative that the conservation of the species through the TAC is established with the best——

Mr. COBLE. Sir, I am sorry. With all the bells, how about starting over if you don't mind?

Mr. SCHMITTEN. We will do it again. The answer is that it does not guarantee there would not be overfishing. Can you hear, sir?

Mr. COBLE. Yes.

Mr. SCHMITTEN. OK. It does not guarantee that there would not be overfishing. It is imperative that the TACs, the total allowable catch, be based on the best available scientific data, and if that is done by the councils, agreed to by the Secretary, there is not much likelihood that it would, but no one can guarantee that it could not.

Mr. COBLE. Thank you, sir. Thank you, Mr. Chairman.

Mr. MANTON. The Chair recognizes Mr. Lancaster of North Carolina.

Mr. LANCASTER. Thank you, Mr. Schmitten, and welcome to the Committee. I regret that the first appearance of the Secretary of Defense, Mr. Perry, was in my other Committee at the same time you began here, and I wanted to hear his testimony. So I came here to ask you questions, and I will go back to him when I have had my opportunity to talk with you here today.

It is my understanding that ITQs are already in use in certain fisheries and are under consideration in a number of councils. I wonder, first of all, if you have not already done so, can sort of give us an update on the status of implementation of ITQs in other fish-

eries and comment, if you would, on the need for our addressing this further in the Magnuson Act, if we already have them in some fisheries that are implementing them in others? Is there a need for specific statutory language to either expedite or help implement the process that is already in place and continuing to grow?

Mr. SCHMITTEN. Congressman Lancaster, currently there are three ITQ systems that have been adopted and approved; one in the Northeast for surf clams and ocean quahogs, one in the Southeast for wreckfish. These are fairly small fisheries, and since 1991 when they first went in, they have reduced by about half the numbers of vessels in those fisheries. There is a major one that has just been approved in the State of Alaska for sablefish and halibut, and this deals with nearly 5,000 vessels. That will officially come on line in March of 1995. Of the eight councils under Magnuson, seven currently have limited entry programs under consideration or adopted. Six have adopted limited entry or ITQ programs.

The Magnuson Act change that we will be proposing is the ability to assess the cost for implementing and enforcing the ITQs, and we believe that for the privilege that the individual gets, they should be paying an economic rent to the citizens of the Nation for that privilege.

Mr. LANCASTER. How is that cost being recovered now?

Mr. SCHMITTEN. Right now it is not. It is coming out of the general Treasury through appropriations. We have indicated that we can cover this year's cost, and I don't want to say minimal, but they are not significant in the East Coast. The Alaskan ITQ may go up to as much as $3 million a year.

Mr. LANCASTER. Of course, the basis for ITQs, in my opinion, must be the protection of the resource, but it in and of itself will not be adequate to do so. I wonder if you could, if you have, again, not already answered this question, perhaps share with us some other conservation measures that may complement or work hand-in-glove with the ITQs to maximize the protection of the resource?

Mr. SCHMITTEN. Well, the standard measures that a manager has in his quiver is an adjustment of time—that would be the seasons' opening and closing; adjustment of areas—what areas you can and can't fish in; and usually the adjustment of gear—the mesh size, the style of the take of the fish.

Mr. LANCASTER. But would you anticipate that these tools would be used in conjunction with ITQs?

Mr. SCHMITTEN. Yes, I would say that they could be, but you would not have to do that. What you are really allowing is the flexibility of the person that chooses an ITQ system to decide when they want to fish, to maximize the economic return to that fisherman, to give a higher product quality to the public at large. Those are the plus sides of ITQs.

Mr. LANCASTER. But if the ITQs are not adequate, and I don't think they always will be, to fully protect the resource, are there other conservation measures that in your opinion will complement or help to guarantee the conservation that we need when the ITQs are inadequate?

Mr. SCHMITTEN. If we are not making it, it is primarily an assessment that indicates we are overfishing. So one of those measures would be better enforcement. Two, would be better statistical

data which fishermen continue to tell me that we are still not doing a very good job at, to make sure that it is accurate—how much we see that they can take because they are going to take how much we allow them. And if our assessments are wrong and we are overfishing, as you have indicated, that would be a mistake.

Mr. LANCASTER. Thank you very much.

Mr. SCHMITTEN. Thank you very much.

Mr. MANTON. In sort of the "Studds' rule," for Committee procedure, I will recognize Mr. Hamburg, who has been here from the beginning, although I know there are some more senior members of the Subcommittee currently present who have not yet had an opportunity to speak.

Mr. HAMBURG. Thank you, Mr. Chairman. I will just maybe not take a full 5 minutes. I am particularly concerned about whether ITQs lead to the domination of fisheries by larger industries, and I wanted to ask you specifically about the mid-Atlantic surf clam industry where ITQs have been implemented. And my understanding, and this comes from people within the California fisheries organization that I often work with, that when that system was put in place, there were improper restrictions on the percentages that could be owned by individual industries. And so what apparently happened was that larger companies were able to obtain the greatest share and then sell back those shares to fishermen and also control how much was paid for those quotas. So I would like to know with respect to that particular fishery, is that true, and, if so, how could we avoid those kinds of situations in the future?

Mr. SCHMITTEN. I haven't heard all of that being brought up in the past. Let me tell you what I do know about that fishery. It was the first ITQ system in the nation. It has reduced the fishery from, I think, 131 vessels down nearly half of that—down to 63 vessels; that in one side of the fishery—remember it is surf clam and quahog which are both clams, but quahog—currently about 35 percent of the ownership rests in a single permit holder's hands.

And so that has raised the area of concern, and we have looked at it. It has not triggered, in our view, a monopolistic situation, but it certainly signals that what was hoped to happen is a reduction in fishing effort, a more viable fishery with fewer fishermen, and the ability to plan ahead. Now, let us make sure that we can monitor and that it does not go to the point of some sort of consolidation as you indicated.

Here are the safeguards that could be implemented. If that occurs, that council could at anytime step in and say, "We would like to indicate what the percentage that this council would accept of ownership in any single permit holder's hands." Alaska chose to do that.

Mr. HAMBURG. Now, would those be standards be set by NMFS, or are you talking about standards set by individual councils?

Mr. SCHMITTEN. Yes. And they can do that at any time.

Mr. HAMBURG. I was also concerned about the CDQs that you were talking about and whether there was a danger that local governments would lease these CDQs to the highest bidder and thereby exclude from the fishery other entities?

Mr. SCHMITTEN. I don't know the answer to that. Let me find out for you.

[The following was supplied after the hearing:]

The North Pacific Fishery Management Council intended that western Alaska communities in the Bering Sea and Aleutian Islands could receive an allocation specifically to achieve economic benefits for underdeveloped coastal communities. Such recipients are expected to maximize such benefits, which could involve leasing a harvest privilege to the owner of a fishing vessel who offers the most benefits.

The pollock community development quota (CDQ) is granted to six community associations that employ large vessels with fishing/processing capability in a high-volume open-access fishery. A vessel operator that is not successful in obtaining a lease to take pollock CDQ has the option of operating in other open-access groundfish fisheries.

The fixed gear Pacific halibut and sablefish fisheries in the IFQ limited access system use smaller vessels. The communities that receive halibut and sablefish CDQ allocations intend to develop fishing and/or processing operations in the local area but may need initially to lease their CDQ. However, any fisherman who is not awarded a lease is not excluded from fishing any IFQ quota shares controlled by that person, or participating in the open access groundfish fisheries.

Mr. HAMBURG. I mean, could it become a highest bidder situation and thereby, you know, individual fishermen who couldn't stay in with the bidding war would be aced out?

Mr. SCHMITTEN. It is certainly not under the philosophy that I would have for CDQs, which is to help small—in this case, it was small—isolated Alaskan communities, to help their fishing fleet. To simply take those CDQs and profit by them and not help those that they were directed to, philosophically, I would have trouble with that, and I think it is a point that you make.

Mr. HAMBURG. Well, philosophically, I would too so——

Mr. SCHMITTEN. And I will respond further if there are additional answers to be provided.

Mr. HAMBURG. OK. Thank you. Thank you, Mr. Chairman.

Mr. MANTON. Thank you. Mr. Reed, we are going to break, but maybe, if you can squeeze in a quick question, we can excuse Mr. Schmitten before we go vote, and then proceed to the next panel when we come back.

Mr. REED. I can squeeze in a question, Mr. Chairman. Thank you very much. This is following I think the theme that Mr. Hamburg has brought up and that is the ITQ system seems to be appropriate in terms of allocating resources, allocational efficiency—but have you looked closely at the distributional effects, i.e., who are the winners? Are single operators with low capital able to participate in these systems, or does it turn out that the person with the biggest pockets who can buy the ITQs ahead of time are the winners, and the small operator, the single fisherperson, is the one who ends up on the beach?

Mr. SCHMITTEN. Thus far, actually, the only two that we have experience in, in general, the quality fisher or the highliner is a winner. He has been able to compete and do well. The marginal fisher may choose to simply sell, which becomes an asset, his share. I cannot say that it is a corporate structure, and the winners are the people with the most money at this point. And we have—you know, two small fisheries to judge this by and less than 150 boats.

Mr. REED. Just a quick point. One is, would you pay attention to that to see if there is any systematic bias toward one group or the other, and I guess since you only have a small sample to date, does that give you some caution about going forward with a broader reach for these ITQs?

Mr. SCHMITTEN. Well, let me look at the systematic bias. There are many nations of the world who have been doing this since 1986. In fact, I think there were six we went through last night. I was reading several reports. Let me see if there is anything that came out of that as a systematic bias too, and that would give us a good indication of the question that you asked.

[The following was submitted following the hearing.]

In the common situation where ITQs are introduced into overcapitalized fisheries, usually one of the primary objectives is to rationalize the fishery by reducing fleet capacity. If the ITQ is freely tradable, then it is highly likely that there will indeed be a systematic bias: those who are successful will likely buy out those who are operating at the margin in terms of profitability. In most other sectors of the economy, the free exit and entry of firms according to financial success would be considered normal and desirable. Marginal fishermen are more likely to risk the safety of themselves and others by fishing in bad weather and performing minimal maintenance on their vessels, and they are more likely to violate conservation regulations if such action can be used to increase catch rates.

However, it is important to note that "small" or "traditional" does not necessarily mean "marginal." In some fisheries, the relative profitability of small operators may be greater than that of large operators. For example, in the case of species for which fresh, high quality fish commands a premium, smaller hook and line vessels may be able to exact higher prices due to better handling and shorter trips. The combination of higher prices and significantly lower operating costs (e.g., lower capital costs and lower opportunity costs of labor) can render these vessels very competitive on the ITQ market where prices are synonymous with profit per unit of weight. Thus, it is not necessarily true that small operators will eventually be bought out by large companies.

Once initial quota is allocated, no one is forced to sell it. However, there may be several good reasons to sell. Fishermen may want to exit a fishery if the money from sale of an ITQ can be used to clear debts, invest in an alternative, less risky enterprise, or provide funds for retirement. In addition, some small operators may find it advantageous to sell their ITQ to a large company in return for an ongoing contract that allows them to keep fishing the quota, and possibly to pool quota with other fishers in order to smooth fluctuations in catches. The latter has apparently occurred extensively in New Zealand where fishermen wanted to minimize the amount of paperwork they were required to do, while at the same time being guaranteed a market for their catches and possible financial assistance from the company in times of need. In this respect, fishermen traded away much of the risk associated with fishing and at the same time received funds that could be reinvested in fishing or elsewhere in the economy.

It is interesting to look at New Zealand as a case study since the controls on consolidation are minimal by U.S. standards (35% per species per management area or 20% of any species nationwide). In fact, the original designers of the New Zealand system did not see consolidation as a problem (except possibly the extreme case of a monopoly) if the end result was indeed the most economically efficient structure. Also, fewer players would make communication, enforcement and consensus much easier, and would reduce the costs of managing the system. In the first 18 months following implementation of a program involving 29 species and 10 management areas in October 1986, there were 15,580 quota sales involving 453,000 tons, and 3,417 leases of quota involving 253,000 tons, the sum of which exceeded the total amount of quotas (494,000 tons owned privately and 64,000 tons owned by government); therefore some quota was involved in multiple transactions. During the first 2 years, the total number of quota holders decreased by 5.7% and the amount of quota held by the top ten quota owners increased from 57% to 80% of the total. Further consolidation has occurred subsequently, although in some specific fisheries, such as abalone, the reverse has occurred with the original quota holdings being gradually split up over time.

Interestingly, the nature of the industry on the water has not changed significantly. As far as can be discerned from the available statistics, there have not been any major changes in fleet structure. Large company vessels have not displaced smaller owner-operated vessels in the inshore fishery. If anything, the number of small vessels appears to have increased, although information on utilization is not available. There has also been an increase in the number of larger vessels, reflecting expansion of the deepwater fishery where the main effect of ITQs has been to encourage investment in technology, development of innovative markets, etc.

One final point from the New Zealand example is the overwhelming support that has developed for the system, despite initial reservations and fears expressed by the industry and others. While many people may feel that certain aspects of the design need improvement, virtually all knowledgeable or involved parties are in favor of the system as a whole and would not want to return to the former open access approach, nor to adopt any radically different alternative.

In summary, the answer to the question is that if consolidation can occur, it probably will; that in most cases some degree of consolidation is probably required to rationalize fishing fleets; that consolidation probably will be biased towards the most economically efficient units; and that where objectives other than economic efficiency are deemed important, quotas can be allocated on the basis of regions/communities or fleet categories and the extent of consolidation limited by regulation. Note, however, that the greater the number of restrictions placed on the free trade of ITQs, the more potential overall economic benefits will be compromised.

Mr. REED. Thank you, Mr. Schmitten. Thank you, Mr. Chairman.

Mr. SCHMITTEN. Thank you.

Mr. MANTON. That concludes our first panel. We are going to take a break for two votes; I think we have 4 minutes remaining on the first vote. We should be back here, hopefully in about 10—15 minutes.

[Recess.]

Mr. MANTON. Ladies and gentlemen, if we could have panel two come to the witness table, we will get started. Panel two: Mr. Mark Lundsten, an independent fisherman; Mr. Thorn Smith, Executive Director, North Pacific Longline Association; Ms. Shari Gross, Halibut Association of North America; Mr. Bill Orr, Chief Operating Officer, Golden Age Trawlers; and Mr. John Iani of UNISEA. And, I suppose we will take testimony in that order. So, we will lead off with Mr. Mark Lundsten.

STATEMENT OF MARK LUNDSTEN, INDEPENDENT FISHERMAN

Mr. LUNDSTEN. Thank you, Mr. Chairman. My name is Mark Lundsten. I am the owner and operator of a 70-foot longline boat, the *Masonic,* 70 feet long. I am a member of Fishing Vessel Owners' Association out of Seattle. The fleet that I am a part of, the halibut fleet and black cod fleet, is a little over 100 years old right now. We are the first groundfish producers off the West Coast, and we have the distinction of having Harold Lokken, our first manager of the two managers we have had in the history of our association, pretty much write the Magnuson Act at Senator Magnuson's request.

The Seattle fleet is very much in favor of the IFQ program that has been passed for black cod and halibut, and we are, I think, part of a whole professional fleet that has been in favor of it and has generated the idea from the ground up in the last 7 years. About 10 years ago, we all really started trying to get something done about the halibut fishing conditions that we had due to overcrowding. We started with the halibut moratorium. Over the years we have sort of backed our way into IFQs as the best alternative. No one was born believing in IFQs.

What we have done is look at all the options over the years. After the very, very arduous process of hearing after hearing and study after study we have come around to what I think is going to be a really good program. I am not here to be a missionary for IFQs for every fishery by any means; but, I will tell you I am a real missionary for our program.

When I started fishing, I was really proud to be accepted as a peer, first as a crewman in a very demanding profession, and next as a vessel owner who could actually make it among what I considered to be some of the best fishermen around. That fleet extends now from Kodiak to Homer to Petersburg to Sitka, Juneau, Ketchikan, and to Seattle, and until the Magnuson Act, all the way through Canada, I saw that as a very worthwhile institution, one worth saving, and one that I saw eventually drying up and blowing away if we didn't do something.

Open access is the basic problem we have. The race for fish has allowed us or is forcing us to fish under brutal conditions that are ruining the resource and the value we can get from that resource. I think the appropriate buzzword for the system we have now is waste. One, with all the boats that we sent out on the grounds, we are wasting the fish when we have to catch one species at a time and throw back whatever we cannot keep. If we are fishing black cod, we can't keep the halibut; if we are fishing halibut, we can't keep the black cod.

We are forcing ourselves to fish in grounds that are not productive because we have so many boats on the edge for black cod. The result of that is that we have a horrible bycatch problem when we are in the black cod fishery. Boats are being forced away from the edge—the deepwater edge where the black cod live—up onto the shelf where the halibut live and are taking way too many halibut in the course of black cod fishing. For reasons of bycatch in this situation, the whole black cod fishing has often been shut down early, before the quota is caught.

We all have talked about the cost of the program of IFQs. For a number of years, the longline fleet, long known to be a clean fishery, has become a dirty fishery because we are so overcrowded in black cod that we are taking those extra halibut in the shallow water. If we took the black cod that we weren't allowed to catch and took the basic income that the fishermen would get from that and just translated that into the income taxes the Federal Government would get, we would probably pay almost all of the cost of our IFQ program right there.

I think we are also wasting in the race for fish any chance we are having for sustainable management of marine mammal and seabird habitat that may or may not be in trouble for some reason or other. Right now, the mentality of trying to get every single pound of fish you can in the short allotted time we have—conservation concerns like that are really not in the forefront of a fisherman's mind. It just doesn't work out that way.

With IFQs, with the time we can take to harvest the fish, it is going to be much easier both to monitor the fleet and for the fleet to take care of not getting in certain grounds or having certain fishing practices. We will have time to do it.

I would like to say that the overall value of the resource is one of the things you should look at. The Canadian IFQ plan has led them to dominate the fresh fish market for halibut. They have about a 10-million-pound resource. We have about a 40-million-pound resource. Theirs is almost worth what ours is because they have IFQs. In reference to the cost of the program, if anyone fig-

ures those income taxes coming back to the system, they will see that is certainly going to pay for a lot.

Primarily, besides these matters of waste and related concerns, the worst thing about this is, the saddest thing, is that we are wasting lives. I have been next to two boats that have gone down during "derbies," and I have been in a situation where you are a fool if you do it, you are a fool if you don't. I have had very good fishing for one of those 1-day halibut shots. I have had to stack the fish on the deck because I haven't had any choice if I want to keep them. And the weather has turned really sour, and I have been in a dangerous situation that I don't want to be in again. I have been there. I think that is the main reason why the fleet loathes the race for fish now and is very much behind the IFQ plan we have for black cod and halibut. My red light has gone on so I will close it there.

[Statement of Mr. Lundsten can be found at the end of the hearing.]

Mr. MANTON. Thank you, Mr. Lundsten. We will get back to the entire panel for questions after we hear all of the testimony. In the order that you are on my sheet, I will now call on Mr. Thorn Smith, Executive Director, North Pacific Longline Association.

STATEMENT OF THORN SMITH, EXECUTIVE DIRECTOR, NORTH PACIFIC LONGLINE ASSOCIATION

Mr. SMITH. Thank you, Mr. Manton. My name is Thorn Smith. I represent the North Pacific Longline Association, freezer-longliner vessels which fish for cod and other groundfish off Alaska with hook-and-line gear process and freeze their product at sea. I want to thank you for the opportunity to be here.

I have been around for a while. I was a commercial fisherman; went to law school; was a NOAA fisheries attorney, serving here and in Alaska; later on I represented joint venture trawlers, crab fishermen; served as president of a factory trawler company; vice president of the American Factory Trawlers' Association; and now represent longliners, demonstrating that flexibility in the light of changing circumstances is important for survival in this industry.

Over the years the North Pacific Fishery Management Council has struggled with limited entry several times. It has never been easy. It is not easy now. As you have been advised, we have been looking at something called "comprehensive rationalization" for more than a year, including ITQs. At its last meeting in January, the Council decided firmly to put ITQs on the back burner and to move forward with a vessel moratorium and license limitation system—hopefully bolstered by a vessel buy-back program. We support that approach.

Several votes confirmed this decision. The first was the industry advisory panel, 17 to 2, for enacting that program. It survived four successive votes of the Council subsequent to that. Some people have expressed surprise at this. We were not surprised. What I would like to do today is address some of the themes which have emerged in public testimony in recent months which I think will help you to understand what the Council did.

First of all, it has been chapter and verse among all of us that there would have to be widespread agreement throughout the in-

dustry on the details of any ITQ system. Probably this would have to include environmental and public interest groups, who now have a place at the table. No such consensus now exists. It is nowhere in sight. We think the likelihood of any true consensus embracing a broad range of interest groups is very remote at this point. We think the council is going to spend a little time looking at this thing before it moves forward, if it does—and appropriately so. We think it would be inappropriate for the Secretary of Commerce or Congress to attempt to do what the Council is not doing at this point.

The problem, we all agree, is overcapitalization. Many investors made what in retrospect might be called bad business decisions. We built too many boats. We built too many shore plants. Often we were able to do this only with the help of foreign banks. Some people suggest that the way to handle this is to let the excess capital be squeezed out of these investments through foreclosure and resale until they eventually become profitable. It is called risk capitalism.

The question of who pays, the banks or the public, has been raised by public interest representatives. It is a sensitive issue. Some industry participants have raised it as well. Unfortunately, we are all implicated in this. As I said, we have all overinvested, and the question that has been raised is, well, who pays? Do we get a great gift of public property, or do our foreign banks take the hits? The corollary question is just how much are the fish and shellfish worth? Some say they are worth what our investments are worth. Others say that the value is incalculable, and that what we are talking about if we give it away is an incredible windfall.

The market mechanism is stressed as being the solution to rationalizing the fisheries. Public interest people again ask, if you are going to use the market mechanism, why not use it for the initial distribution? They ask further, why should we ever alienate this public property entirely? Why don't we sell temporary rights, tradeable rights to harvest the fish so that as the value rises, the public gets increased rents?

The NOAA Office of General Counsel has suggested that it would be a good idea to analyze this, as have editorial writers. Our Association doesn't want auctions, but we think it is such an obvious solution that if we don't face up to it, and either design an auction program that we like or find a fault with the concept, somebody else is going to do it for us—and we are really not going to like the end result.

There are some conservation considerations, again raised by the environmental community—dissatisfaction with the manner in which our fisheries are conducted today, with high bycatch and mortality. They say we shouldn't perpetuate it by giving ITQs to the practitioners. We should clean it up first through a variety of measures—a moratorium to begin with, which won't really clean it up, and a license limitation program, with harvest priority for selective gear, bycatch reductions, and so forth, which will clean it up. Meal plants are OK, but secondary. If you need a meal plant to take care of your bycatch, you have too much bycatch.

Funding, implementation, administration, and enforcement worry us all. Rather than get into it extensively, I would point out

that NMFS has had a surf ITQ clam plan in effect, as Mr. Hughes said, since 1990. They did a report on their administration and enforcement obligations under it. The East Coast Fishery Foundation submitted a freedom of information request for that report, got it back with about half of the report deleted.

A number of concerns have arisen since then. It has been alleged that in that fishery there may have been price fixing, collusion, threats and intimidation, foreign ownership of the resource, concentration and monopolistic control of industry, disguised ownership, et cetera. These things speak to our deepest fears. We would urge the Committee to ask the National Marine Fisheries Service for the entire report, and hopefully make it public. If you can't do that, we would suggest that you conduct an investigation of your own because this may be what ITQs mean, and we are really worried about it.

In conclusion, we don't think it is feasible to design and implement an ITQ program without firm consensus among the industry and other interest groups. We don't think a legislative fix is going to work, and we don't think that the Secretary of Commerce should be authorized to do what the Council is not doing now. We approve what the council decided to do, and I won't go through it all right now. We think that we should take a very hard look at the program now in effect, the surf clam ITQ plan, and that the sablefish/halibut ITQ plan should be implemented. We should study the results of that before we move further.

I want to make it clear that we are not blindly opposed to ITQs. They may be appropriate at some point, but we don't want to buy a pig in a poke. We want to know well ahead of time, well before anything is approved, exactly how much ITQ each vessel might get, and exactly what data it is based on for each and every vessel; exactly how much it will cost us for fees, taxes, auctions, or other expenses; what limitations will be placed on ownership to avoid excessive consolidation. Will foreign interests be able to own shares, and will shares be fully tradeable?

In terms of what you folks might do, legislation—we think that you should adopt a Magnuson Act amendment providing for the use of selective gear, and bycatch reduction. Full utilization is a subset. It is important, but it is not as important as not catching the bycatch fish in the first place. We think that authorizing a buyback program is a good idea, and I have some observations on that if you care to ask me any questions.

You may have to provide authority to obtain fees in excess of administrative costs or some kind of economic rent to fund these things. We think, in general, that emergency rules for conservation reasons should perhaps be made more easy under the Magnuson Act. We don't think there should be any legislation at this point providing for ITQs. We don't think you should give the Secretary of Commerce authority to do it, and we are not very interested in seeing the cod and pollock fisheries split from the others for the purpose of creating an ITQ system.

We think ITQs should be kept on hold, and that we should analyze the programs now in effect, observe the implementation and administration of the sablefish and halibut plan. We have a consen-

sus on that at this point in the Council, and I think it is going to stick.

I was asked by one major player in our process, who is a fisherman, to advise you that safety is really not a serious issue where the big boats are concerned in the groundfish fishery. It may be with the small boats in the sablefish and halibut fishery, but they have got their ITQ plan. The rest of us just jog when the weather gets bad. Thank you.

[Statement of Mr. Smith can be found at the end of the hearing.]

Mr. MANTON. Thank you, Mr. Smith. Our next witness, Ms. Shari Gross, Halibut Association of North America.

STATEMENT OF SHARI GROSS, HALIBUT ASSOCIATION OF NORTH AMERICA

Ms. GROSS. Good afternoon, Mr. Chairman, and Mr. Young. I am Shari Gross here representing the Halibut Association of North America. We are a trade association of halibut processors that operate in Alaska, British Columbia, Washington, and Oregon. We have about 35 companies as our membership, and they reflect virtually all the halibut processing capacity of the Northwest.

The point I want to make to you today is very simple. ITQ programs are necessarily expensive to monitor and enforce, and you must provide a funding mechanism in order to provide for that if you go for an ITQ system, or the fish will simply disappear. Opportunities for violations or cheating are great under an ITQ system. It is not a system like all others, and it requires very tight management enforcement.

Some of the problems inherent (and this is not to say that these problems can't be overcome or dealt with but simply that they are expensive and require attention); are overfishing, another is highgrading (which is the situation where a larger fish, for example, is offered at a higher price thereby giving the fisherman an incentive to return the smaller fish and keep trying until he catches the bigger fish). Another problem is the length of seasons because the seasons will be much longer under an ITQ system, and you have to have a monitoring and enforcement program in place throughout that season. And, of course, in our case in the Pacific Northwest, it is a very big coastline.

Plain and simple, a system on the cheap costs the fishery. There are lots of examples about this. I will only give you one, and that is the abalone fishery in Canada some years ago where Canada imposed an ITQ system. It was, I believe, their first out there, and they did not provide adequate funding. They did not design a tight system, and there aren't any abalone left anymore. They have learned their lesson, and the ITQ system they have designed for halibut that started up a couple of years ago appears to be quite tight and actually is quite expensive compared to ours.

In fact, their program—if we were to extrapolate it out into the North Pacific and take account just for the difference in the size of the quota and the size of the fleet and disregard the size of the coastline, their program would cost in the United States, about $18.4 million rather than the $3.5 million that Congressman Young mentioned is actually requested in the budget.

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It is hard to be against funding in the abstract, but in reality how do you make it happen? It seems to us that user fees are the only way to go. We are never going to be able to count on an annual appropriation, and the numbers are never going to add up unless there is a user fee in place specifically for ITQs, designated for ITQs, and for the management of them. Again, the cost, if you don't, is the fishery.

It is corny, but it is true, and it is plain and it is simple. The end result is you lose the resource if you don't manage it and enforce it tightly under an ITQ system. All academic literature that I have come across from around the world indicates that this is true. This is by people either advocating or opposing ITQ systems. There seems to be no question that ITQ systems are expensive and that you have to provide a system for them.

The Canadians have a system that is tight and expensive and paid by the fishermen. Ours in Alaska is yet to begin, but I can assure you from the International Pacific Halibut Commission meetings last year, the Canadians are seriously and genuinely worried about our program. They took a look at their program, took a look at ours, and, frankly, there is no comparison.

So we would ask you to keep in mind that there are no quick fixes for this program, and what we are afraid has happened is that NMFS, in its zeal to push forward an ITQ system, has actually designed a monitoring and enforcement program to fit a limited budget of hopefully even $3.5 million; whereas in reality, they should have looked at it the other way and said how do you design a system that is going to protect the resource and offer the most hope for it to continue in perpetuity. And then how do you find the money to pay for it? It is a distinct difference between trying to design a program on a limited budget and doing the best you can do and then worrying about the money.

We need to all pull together in this industry. There is lots of paranoia about ITQ programs. I agree with Thorn Smith that the surf clam program ought to be given to the public. We would like to see the results of it. We would like to learn from it and benefit from it and avoid the same mistakes or maybe make the same good judgments that they did.

But, in summary, we need to remain focused on our bottom line and that is protecting the country's fishery resource. I recommend that we spend less attention on who will make how much and which management regime will be followed, and spend more time focusing on how we are going to be able to protect that for our future generations. Thank you, Mr. Chairman.

[Statement of Ms. Gross can be found at the end of the hearing.]

Mr. MANTON. Thank you, Ms. Gross. Our next witness is Mr. Bill Orr, Chief Operating Officer, Golden Age Trawlers.

STATEMENT OF BILL ORR, CHIEF OPERATING OFFICER, GOLDEN AGE TRAWLERS

Mr. ORR. Thank you, Mr. Chairman, Congressman Young. I appreciate the invitation to appear before this Subcommittee to discuss the issue of individual transferable quotas. I am Bill Orr, Chief Operating Officer of Golden Age Fisheries. Golden Age owns and operates five small- to medium-sized factory trawlers, and it

is a partner and a manager of a salmon processing operation on the Kuskokwim River in western Alaska. Golden Age is also a partner with 17 western Alaskan villages in the Community Development Quota program. A review of fishing operations conducted under this system provides some insight into what might be expected from a comprehensive ITQ program for the multispecies North Pacific groundfish fishery.

The focus of my testimony is on Golden Age Fisheries' experience in the CDQ fishery, but first I would like to discuss the problems facing the groundfish fishery of the North Pacific. Basically, there are too many vessels chasing too few fish. Inaction on the part of the North Pacific Fishery Management Council to impose meaningful limits to entry into the fishery have resulted in severe overcapitalization.

Overcapitalization is the root cause of most of the problems affecting the fishery and the industry. The open-access race for fish reduces the net benefits to the Nation from this vast, sustainable resource. The fishermen who follow the course of action laid out in the Magnuson Act are now on or over the brink of economic disaster. Unfortunately, Golden Age is not immune from this problem. Three of our vessels were foreclosed on during the past week.

A comprehensive and obvious solution to the current problems in the groundfish fishery of the North Pacific is the implementation of an ITQ program. However, the council has proved incapable and unwilling to act in a timely and responsible manner to adopt such a program. Congress should either act to implement such a program through legislation or force the council to implement a meaningful and fair solution to these problems.

As I mentioned, Golden Age has had the pleasure of being involved in a CDQ program with Coastal Villages Fishing Cooperative. That partnership owns the factory trawler *Browns Point* and uses that factory trawler to harvest and process the CDQ awarded to CVFC. Based on our experience since 1992 in the CDQ program, we have identified some significant benefits from participation in an ITQ program. Most are attributable to the absence of a race for fish inherent in the open-access management. We have achieved enhanced utilization of harvested fish.

The philosophy of our fishing operations has changed during the CDQ portion from a dollars-per-day strategy to a dollars-per-fish strategy. Under the Olympic system, the goal was to maximize daily revenue by pushing as much fish as possible through the factory.

During the CDQ fishery, we were able to focus on maximizing the amount of revenue from each fish brought aboard. We were able to increase the amount of saleable product from each fish by taking more care in sorting out fish by size, adjusting the processing equipment, and undertaking more time-consuming tasks such as hand trimming of fillets. We were also able to retain a wider array of species including lower valued fish that would be discarded during an Olympic fishery. Since we are attempting to maximize net revenue over the entire year instead of on a daily basis, we were able to take time to process fish that yield a lower return.

We were able to decrease the catch of unwanted species. The catching of unwanted species or bycatch is a problem in all fisheries. Under the CDQ fishery, we have no pressure to harvest fish in a rapid manner. Our operation can focus on areas where bycatch of unwanted species are at a minimum. If the catch of unwanted species is too high, the vessel can change location or fishing gear without risk of losing fishing opportunities.

The program improves our marketing opportunities. Products from the *Browns Point* are sold to most major users of pollock including McDonald's, Burger King, and Long John Silvers. We have been able to capitalize on our ability to produce fresh, high quality pollock block on a year-round basis. We are able to plan our production schedule well in advance and deliver product to customers as they need it, helping to avoid the high cost of holding inventory.

The program has also increased the planning and efficiency in our vessel operations. The ability to determine when fish will be harvested offers the vessel manager the opportunity to make the most efficient use of harvesting and processing capabilities.

These are a few of the things that we have recognized under the CDQ program. Some other benefits that we expect to realize in a comprehensive ITQ program would be increased utilization of the resource, rational reduction of capitalization in the fisheries, increased job security and crew safety, and resolution of allocation disputes.

The fishermen of the North Pacific need your help to implement a rational management system for the fishery. An ITQ program in which quotas are freely sold, purchased and leased resolves existing allocation disputes and provides mechanisms for addressing the chronic problem of overcapitalization. This approach also provides important benefits in the area of resource utilization, resource allocation, safety, product marketing, and social dislocation.

The Council system will not fairly address this solution. Congress must insist that the Department of Commerce take its proper role in providing leadership in the management of our nation's fisheries resource. In order to achieve the goals of the Magnuson Act, a permanent, fair, and rational market-based allocation system must be put in place. Thank you.

[Statement of Mr. Orr can be found at the end of the hearing.]

Mr. MANTON. Thank you, Mr. Orr. Mr. John Iani, UNISEA.

STATEMENT OF JOHN IANI, VICE PRESIDENT, UNISEA

Mr. IANI. Thank you, Mr. Chairman. My name is John Iani, and I am the vice president of UNISEA, Inc., which is a major North Pacific seafood processing company. Our company is based in Redmond, Washington, where we employ approximately 500 full-time workers who are engaged in the processing of seafood products from the North Pacific. We also operate major seafood processing plants in Dutch Harbor, Alaska, and in St. Paul, Alaska, employing on a seasonal basis about 1,500 workers in those plants.

Since our headquarters are in Redmond and our plants are in Alaska, I have the unique opportunity of being a constituent of Representative Cantwell and a constituent of Representative Young, and I was hopeful that Representative Cantwell would be

here to protect me from the always-tough questions that my former boss, Congressman Young, would like to ask.

Mr. Chairman, given the extreme complexity of the ITQ issue, I guess I would like to begin my testimony with the most important issue to us as processors, and that is with the simple statement that neither my company nor any other company that has invested in the North Pacific fishery can accept an ITQ system in the North Pacific under which we would be excluded from the initial allocation of quota shares because we are processors and not harvesters.

Mr. Chairman, to do so would be the equivalent of a member of this Subcommittee to agree to run for re-election but also agree to not have their name printed on the ballot. We cannot agree to the ground rules under which we would be guaranteed our demise before the game has even begun and neither could you.

Mr. Chairman, even if the industry were united on the idea that an ITQ system was the answer to all the problems of waste, bycatch, and overcapitalization, there are still hundreds of other questions that are left unanswered. Among these are the policy questions enumerated in your letter regarding this hearing, and there are also the practical questions as to who would be eligible for shares and on what historical basis, will there be limits on ownership and transferability, what fees and assessments will be charged, what about an auction system?

I have taken the liberty to attach to my testimony a document recently produced by the North Pacific Fishery Management Council on ITQs for groundfish and crab. This is an outline of the issues which have been identified by the council as of its January 1994 meeting. And if you will look through the document, you will begin to appreciate the complexity of the issue and the monumental task faced by the council or any other group which tries to take on the job of crafting an ITQ system. That is why I believe that this Committee and the Congress designed the council system to analyze problems like these.

The critical question to us stems from the necessary legal changes which might be necessary either to facilitate or to enact an action on ITQs. I am not sure that anything should be done to restrict the councils. Right now they have broad authority, as was designed by this Committee, to explore a variety of effort limitation systems, and I believe they need this authority.

In terms of the legal challenges needed to facilitate council action, there needs to be a minor clarification of the North Pacific Council to have access to a full range of ITQ options which have been identified. Congressman Young has already pointed out that there is a NOAA general counsel opinion that processors cannot be awarded processing shares. It is our opinion that from both a legal and practical point of view it is incorrect to continue the notion that our plants, simply because they are built on shore, are not a part of the fisheries of the United States and, therefore, fall outside the scope of the Act. We must comply with the Federal permitting requirements, reporting requirements, and observer requirements similar to any vessel fishing in the North Pacific as well.

Mr. Chairman, the major challenges to the National Marine Fisheries Service in implementing any ITQ system will be related to data and enforcement. The process of awarding the tracking

ITQs, especially for a large fishery in a large geographic area such as Alaska, is extremely complicated. The agency will need far greater data-processing capacity than it currently has, and as for enforcement, not only NMFS but also the Coast Guard will be hard-pressed to monitor the activities of the entire groundfish fleet.

It is important to remember, Mr. Chairman, how we got into this mess. It was the industry itself that caused overcapitalization. It wasn't the government that caused it as much as we like to blame the government for it. We did it to ourselves, and now we are coming to you and asking for you to give us the keys to the car, and we will take care of it ourselves. You certainly wouldn't give the keys of the hen houses to the foxes simply because there were too many foxes inside, and I suggest that you look very, very carefully before you give the keys to this fishery, to the very people who have caused the overcapitalization mess.

Coming back to my opening argument, I want to again emphasize that if there is to be a government-funded buy-out program for this fishery, we want to and must participate. It would be grossly unfair for the Federal Government to implement a management system whereby they provide subsidies worth hundreds of millions, if not billions of dollars only to certain participants. As Dr. Lee Anderson will testify behind me, the recognized expert on ITQs, he has said anyone who has invested in pollock processing capacity and who is not compensated by the government under an ITQ system will not be treated equitably.

Our company alone has invested over $150 million in plant and equipment to participate in this fishery, to provide markets for U.S. fishermen. If our competitors receive ITQ shares and we do not, then this $150 million investment will be taken from us without support of our own government. Obviously, we cannot and will not allow that to happen.

This concludes my testimony, Mr. Chairman, and I am happy to answer questions. And I also echo the concern of other panel members here to see what really happened in the quahog fishery and surf clam fishery. Thank you.

[Statement of Mr. Iani can be found at the end of the hearing.]

Mr. MANTON. Thank you. That concludes our testimony from the panel, and we will move to some questions. My first question is for Mark Lundsten. What is the most fair way for assessing quotas, based on historic fishing activity? Would it be fair to identify a point in the past before overcapitalization occurred in a particular fishery, perhaps January 1, 1989, and grant quotas only to those who were participants at that time?

Mr. LUNDSTEN. Well, I assume you are asking this on fisheries yet to be—have any allocations given to them?

Mr. MANTON. Yes.

Mr. LUNDSTEN. Well, in my opinion, to echo what we did in the black cod and halibut, the fishermen who historically fished for many decades and managed that resource very well established the Halibut Commission basically on their own volition. They had limit and lay-up programs and a whole number of voluntary things that made the program work. Their good management, their good stewardship of the fishery was what allowed the fishery to provide an

overgrowing population the opportunity to make a mess of that fishery.

The same thing has basically happened now in the North Pacific for groundfish. Those pioneers of the fisheries are the ones who are now being victimized by a lot of other people coming in. Now, I don't think you should be blaming someone for coming in, but in black cod and halibut, we gave credit to the people who had been in the longest. It was strictly based on an historical production. The original allocation was distributed throughout Alaska and Seattle—predominantly Seattle as far as Washington State goes—about 50/50. So, you know, there wasn't an enormous uproar about that issue, about what was fair for assessment of the quotas or assessing catch history and so on.

For the groundfish and crab, it seems to me that—I assume those are the fisheries you are really asking about here—one should take a common date for those fisheries, since the trawlers and the crabbers have such a crossover between the two fleets. We should recognize that the people who developed those fisheries, when half the people thought they were crazy for doing it, should be given some credit for doing that, for taking that risk and taking that responsibility. I do think that historical participation is an equitable way, a fair way of doing this.

Mr. MANTON. Should there be any limitations or a cut-off date though to sort of eliminate the johnny-come-lately folks who perhaps, because they overcapitalized and overinvested, caused all the problems? Should they be cut out?

Mr. LUNDSTEN. Well, one of the arguments for IFQs is that you really don't have to cut anybody out. That is one of the academic arguments that I have heard—that the latecomers get something, as opposed to license limitation where you have a situation of black and white like an on/off switch—you are either in or you are out. With IFQs, well, a guy who has been in 1 year or 2 years under a 5-year qualifying period or a 10-year qualifying period is still going to get something. And maybe he won't have enough to fish, but he is going to have enough to sell to somebody to cover the losses of not being able to fish. He will be paid for getting out of the fishery, and he will be paid by people who are staying in the fishery or entering it. It will be a buy-back program funded by the fleet itself, by the industry, not by any Federal program.

Mr. MANTON. Thank you, Mr. Lundsten. Mr. Orr, in your testimony, you talk about placing observers on every vessel. Who should pay for these observers?

Mr. ORR. Well, right now in the North Pacific there are observers on all of the groundfish trawlers, and we have observers on each of our vessels, and the industry pays for them. And as a matter of fact, on our largest boat, the *Browns Point,* during the CDQ portion of the fishery, we have two observers on board. And I think that the industry is willing to pay the costs of management of that fishery, the increased costs that are going to be caused by an IFQ program, because the benefits that they receive from such a program will allow them to cover those costs.

Mr. MANTON. Ms. Gross, would it be fair to impose the costs associated with what you refer to as the cadillac of fishery manage-

ment programs on your members, or should the cost be placed on those who sell their allocation for a possible windfall?

Ms. GROSS. Well, first of all, Mr. Chairman, my members are processors so they were cut out altogether under the halibut ITQ system. It is only now that we are talking about the Bering Sea, that there is processor concern about being omitted from the program, but, in fact, my members are omitted from the halibut ITQ program.

But, in general, I suggest that we probably need to have annual user fees assessed to the industry and based somehow on the percentage of their quota, and that those moneys are delegated directly to the ITQ program and to managing it. It seems not a lot different to me than charging stumpage fees, and we certainly do that in this country, for timber rights or grazing fees or oil leases, and it is only the fishery resources that we have been pretty much giving away for free.

Mr. MANTON. Mr. Smith, as part of your testimony, you attach about 100 pages of addendum. In under 2 minutes, can you please tell us what these addenda demonstrate?

Mr. SMITH. Under 2 minutes? That is cruel, Mr. Chairman. I think it was Mark Twain who once said, "I would have written you a short letter, but I didn't have time."

The first of these contains a number of news and editorial articles which basically back up things that I had stated in my testimony. Certain elements are highlighted so you can find them easily. There is a portion of the National Agenda of the Marine Fish Conservation Network that we support with respect to minimizing bycatch problems. There are two documents by the National Marine Fisheries Service which point out exactly how much harvest and discard there has been in our fisheries in the North Pacific. I would encourage you to take a look at those things to appreciate the magnitude of our bycatch problem.

The second document has to do with selective gear. We presented a Petition to the council back in 1991 which has produced a fishery management plan amendment giving some preference to fixed gear, or at least dividing the cod TAC between fixed and mobile gear. Appended to that is a synopsis of what I am told is all of the literature in English addressing or comparing hook-and-line gear to trawl gear. Pretty interesting. I think if you take the time to browse through those 10 pages or so, it will be an eye-opener for you.

There are some documents in here relating to some videos we did on careful release. We have developed some mechanism for releasing halibut before they come aboard. Mr. Manton, I am going to leave several copies of that video with your office in case folks want to borrow them to see them. The videos are on Mars right now I think, where Northwest Airlines delivered them last night. I will get them to you as soon as I can. Several other documents are included. I encourage you to take a look at the last one by a gentleman named Peter Matthews which describes what happened to Canadian cod stocks.

The final, large package from the East Coast Fisheries Foundation relates to the report done by the National Marine Fisheries Service on the surf clam and ocean quahog ITQ plan, and I ask you

folks please to try to obtain that in its entirety and make it available to us.

Mr. MANTON. Thank you. I am going to exercise the prerogative of the Chair and ask just one more question of Mr. Iani. Mr. Iani, how do you believe quotas should be allocated, and, further, how do we address the concern that current ITQ allocations amount to a Federal giveaway?

Mr. IANI. Well, I guess to answer your second question first, I believe that is what it is. I think it is a Federal giveaway. You know, I empathize with Mark and I empathize with Bill and those who are out there fishing, but we have got to remember it is a public resource. And because they were able to go out there and gather up these free fish and make a pretty good living at doing it doesn't mean they have the historical right that they get into perpetuity.

And if you are going to go and set up an ITQ program, then you must equitably allocate to everybody who has taken the risk, the financial risk and the expense of investing in the fishery, and that is why I think it needs to be looked at very carefully, and I think processors and harvesters and communities as well should all be involved in this, if you are going to do it, an initial Federal giveaway.

Mr. MANTON. Would your formula include people who are currently out of the fishing industry? Let us say they are out 2–3 years, but they had been in the industry before. Would they be able to come in now and make a claim as being historic participants in a fishery?

Mr. IANI. You know, if I were God, and I am not, I guess my emphasis would be, if you are going to an ITQ fishery, you would want to freeze the fishery where it is today. Who is in the fishery today? Who is here? What do we want it to look like today? Those who have gone away have gone away for whatever reason. It would seem to me to be unfair to now give them a windfall for history that is 3 or 4 or 5 years old.

Mr. MANTON. Thank you. And I will turn the questions over to Mr. Young.

Mr. YOUNG. Thank you, Mr. Chairman. I was interested, Mr. Iani, about your comment about a giveaway. I hope we don't get this started down the pike on those that are supporting the IFQs or itqs, whatever they are, because in reality there is a lot of precedent being set previous to the fishing issue—timber, stumpage rates, royalties, oil rates, mining, and the whole bit—and spectrum. It ends up with a program here especially those that have the exclusive rights taking something and really basically it is a windfall. And I have to believe Mr. Iani is correct, just for your information, that if there are going to be any ITQs, the people that work with the system as established now have to be included—all inclusive.

I agree with Mr. Iani if somebody has gotten out of the business, I don't think he should be allowed back in it. And I just want you to understand that there are people in this Congress right now that are looking for every way possible to raise moneys. Just keep that in mind.

But, Mark, you made two statements that bother me. In your written statement, you said that there is no property right attached to granting an ITQ, and yet in your closing statement you say at

least those that have something out of it they could sell their ITQ. Now, is that contradictory or——

Mr. LUNDSTEN. Well, I guess I assume a property right is something that, you know, you have, and the Government is not going to take it away from you. But what we have always testified, and I think I speak for not just myself but our whole organization of people who are in favor of IFQs in the halibut business, we want a rational fishery. We don't want a giveaway. We will do anything we can to get rid of the windfall and still make the system work. We will pay our way, and when it was written into the council documents, it said it was revocable by the council. Now, to me, that means that can be taken away at any time. That is part of the law. It is part of the deal. And I agree to that. I am pushing for that.

Now, the way it works, the transferability of harvest rights I see as a little different as a transferability of property. It is like owning a house. It is mine, and I am going to sue somebody if they try to take it away from me. It says right on the document the way I understand it, and I am not an attorney—the way I understand it is it is not a permanent deal from the get-go. It could be taken away by the council if they decide that this isn't working. It can be altered, changed, or gotten rid of.

Mr. YOUNG. OK. But now let us say that you have these IFQs or ITQs. It gets mixed up all the time. Are you saying that you would support the concept that your shares could not be sold?

Mr. LUNDSTEN. There is a problem with that in the economics of it, but I think that if there was a way that we could make the system work without me getting any economic benefit from the sale of that, sure. I could cite instances when I am sure Rod has heard me testify at the North Pacific Council on that one.

Mr. YOUNG. See, that is my biggest concern right up front. You know, I have two things that I can see occurring. In the first place, I am not sure we are going to catch any less fish, number 1, because those that don't have the appropriate amount to be economical will sell their quotas. And if you base it on what is existing right now—effort taking place right now, you are still going to catch a sad amount of fish. It just means that those who catch them will make a little more money. I don't think you are going to decrease the strain on the species.

But I have watched the limited entry permit which we have had for years, and the amount of moneys that have occurred to those that had tickets and sold them out of State, and that was never why we passed the limited entry permit. If you look at the percentage in Bristol Bay now, a huge percent of those permits are owned by lawyers and doctors and politicians and people like that who were never fishermen. So I am going to look at this very carefully, that the value of the ITQ granted by a council or a government is not only a windfall, that, in fact, it eliminates the concentration. Like I say, 100 people could own the whole halibut fishery. I don't think that is correct either.

Mr. LUNDSTEN. 200 people could own the halibut fishery, and that is disregarding the block system. It is a half a percent for halibut. That is traditionally what we had in the 1950's and 1960's—about 200 boats. And the block system that has been put in is actually going to make it more like about 500. There are going to be

a whole lot of small boats with small quotas by the way that is designed.

Mr. YOUNG. Mr. Orr, you know, it was the factory trawlers if I remember right who were the biggest supporters of the Anti-Reflagging Act, and if I heard you correctly, you said that the Act has caused overcapitalization. Are you suggesting we repeal that Act?

Mr. ORR. From a personal standpoint, sure. I would be for that.

Mr. YOUNG. You would like to repeal the Act after——

Mr. ORR. I would be. Our boats were all built here in the United States. They were built before the Act. The first one was built as a joint venture boat that could also fish in the factory trawler fleet because we couldn't find any markets ashore. The second one was built in Tacoma. If you wanted to reconsider that as a way to get vessels out of the fishery, I guess you should look at doing that. I think that it will be fairer to people that have come into the fishery to have a rational buy-back program, and that is part of an IFQ/ITQ program. It is a market-based buy-back program, in essence, and that is what I think is a fairer way to approach that.

Mr. YOUNG. Not to be—maybe my hearing is bad—is your group for or against the ITQs?

Mr. SMITH. You are asking me?

Mr. YOUNG. See, I am just simple. I want you to say yes or no, you are against or for.

Mr. SMITH. We are pretty concerned, Mr. Young, about what we see going on right now. We think there are a lot of people out there trying to do a slam dunk that we don't like. We think a lot of thought needs to go into it. There are a whole lot of unanswered questions which we have laid out in some detail in our testimony. Ultimately, it may prove that after we have cleaned these fisheries up and made them make more sense than they do now, then an ITQ system would make sense. But we think that in our current circumstance, it doesn't.

Mr. YOUNG. I appreciate that because that is what I thought you said, but I get mixed up about buy-backs and all the rest of it, and I was——

Mr. SMITH. Yes. You know, ITQs may prove to be a very useful tool. We think, given our circumstance right now and the formulas that are being proposed and whatnot, it is not necessarily the way to go at this moment. There are a lot of questions that need to be asked first, and answered.

Mr. YOUNG. Well, Mr. Chairman, I have a couple more questions, but I am not in a big rush to ask them. I just personally have got real—as one that travels the State of Alaska extensively, I have not found that overwhelming support of this program, although I have always in my career worked on the idea that councils actually should be the managers, not necessarily the Congress. But it is difficult for me to see where this is going to benefit any species retention if we have the same effort now. If we were just to say, all right, no more boats, we would do the same thing—really what we would do.

But it means that everybody else would have to fish at this level right now, but we are not saying that, and the IFQ is what we are doing is saying, you know, "Bill, you have been fishing so you get,

to me, a license to do something that nobody else can get, and, quite frankly, you may not be making as much money now as you want to make because there are a lot of competition out there." But in reality I have never been happy with this program, and I have told Clem Tillion and everybody else this so it is nothing new.

But I am going to go with the council, and we will see what happens, and our responsibility is to review this as far as we can to see what is best for the species and for the industry and for those on shore. Now, I want to tell you right up front where I am coming from, and then I will be quiet, Mr. Chairman. I have never seen a fish vote yet, nor have I seen an offshore crewman vote yet, and I see a man come back on shore and participate in the community, he votes. Now, he may vote against me, but the fact of the matter is he has got something to say about what I am doing.

So I am very much excited about making sure that those who have invested and those that have the participation of on-shore facilities and small communities that they retain that ability to do so, and that includes the community quotas and IFQs. The first guys I find out are running offshore and dumping those fish on foreign freighters, we will come back to this program. Just a little, you know, heavy lead across the bow once a while.

Mr. MANTON. Thank you, Mr. Young, and my thanks to the panel. We have a lot of questions, but we have another full panel and we would like to try to get everybody out of here by about 5 o'clock if we can.

Our third panel will consist of Dr. Lee Anderson, Chairman, Mid-Atlantic Fishery Management Council and Program Director, Marine Policy Program, College of Marine Studies at the University of Delaware; Mr. Dave Wallace, President, Wallace and Associates; Mr. Wally Gordon, Mid-Atlantic Foods; Roger McManus, President, Center for Marine Conservation; and Mr. Rod Fujita, Environmental Defense Fund. And we will start off with Dr. Anderson.

STATEMENT OF DR. LEE G. ANDERSON, CHAIRMAN, MID-ATLANTIC FISHERY MANAGEMENT COUNCIL AND PROGRAM DIRECTOR, MARINE POLICY PROGRAM, COLLEGE OF MARINE STUDIES, UNIVERSITY OF DELAWARE

Mr. ANDERSON. Thank you, Mr. Chairman. I would like to say at the start that although I am Chair of the Mid-Atlantic Council, I am speaking on my own behalf here today. I am going to briefly summarize my longer written comments which I have presented.

ITQ regimes distribute harvest rights to shares of a biologically determined total allowable catch to industry participants. As such, they are a significant change from traditional regulation. However, property rights are the basis of all other natural resource management in this country including rangeland, water, minerals, petroleum, and forest. What is new in fisheries with ITQs has been commonplace in other resources for centuries.

There are two main benefits of ITQs. First, a quota-based system is better suited to achieve conservation because it directly limits catch. Traditional regulations such as gear restrictions, closed seasons, and closed areas limit the way individual participants may operate, but they provide a very loose cap on total harvests. In addition, these restrictions can have untoward effects on harvesting

and processing costs, bycatch levels, and crew safety. ITQs also provide incentives for ITQ owners to support conservation because the value of their ITQs depends upon the health of the stock.

ITQs also reduce administrative detail and increase operator flexibility. This lowers government costs and allows participants to reduce costs and increase market value. This results in a harvesting and processing capacity more closely aligned with the average annual productivity of the stock.

The benefits of ITQs are particularly relevant given the problems currently facing East Coast fisheries. Because most stocks are overfished, councils are instituting vessel moratoria. These programs place participants into small boxes which reduces the flexibility necessary to operate profitably. They also force nonmoratoria boats to move to those fisheries with no entry limitations which can exacerbate management problems there. A comprehensive ITQ program, on the other hand, could achieve conservation while still providing flexibility. The limits would be on total mortality of each fish stock, not on which boats could operate in each fishery, and how, when, and where they could fish. The boats could accumulate the types and amounts of species ITQ which best suit their need.

ITQs could also play an important part of rebuilding programs. In order to allow stocks to grow, fishing mortality has to be reduced, sometimes by large amounts for long periods. This can be hard on existing participants. What are they supposed to do in the meantime, and how can they obtain the benefits of renewed stocks if they go broke? If participants are given ITQs based on a percentage of the TAC, they will have maximum operational flexibility during rebuilding, or they may sell their rights and leave the fishery with some compensation.

ITQs can help achieve conservation goals and also provide financial assistance during rebuilding. In addition, they can help to ensure that those who bear the cost of rebuilding can achieve some of the benefits, and with tight government budgets, the financial assistance can be provided without subsidies or grants.

There are potential drawbacks to ITQs. Highgrading, the complexities of use in multispecies fisheries, and enforcement costs are frequently mentioned. The point is that all management techniques have potential shortcomings. There is no perfect system. The issue today is not who can provide the longest list of advantages or disadvantages of ITQs; rather, it is whether an ITQ system which is properly designed and implemented for a particular fishery has the potential to better achieve conservation, distribution, and efficiency objectives than does the current system. I believe that for many fisheries ITQs have that potential.

Finally, I support a change in the Act that would permit annual fees on ITQ owners or the use of auctions or other means of tendering quota. This would allow for compensation for the transfer of public resources to private hands. However, the fee structure should be explicitly announced from the start, and it should be designed so as to not inhibit owners from searching for less costly ways to harvest, process, and market fish.

It would also be beneficial to amend the Act to ensure that councils consider two critical issues as they deliberate ITQs. First, the financial distribution aspects of the initial allocation of quota goes

beyond merely who gets the harvest right. In an overcapitalized fishery where there is more harvesting and processing capacity than is necessary and where the capital is specific to that industry, those who do not receive quota can suffer decreases in the value of their capital. To ensure an equitable allocation, all segments of the industry, including processors, should have an equal opportunity to obtain quota.

Second, the security of the harvest right is critical for ITQ owners to have the incentives to conserve the stock and to seek efficiency gains. Therefore, it is important that everything be thought out in advance. While it is necessary to make corrections for significant mistakes, unnecessary fine-tuning must be avoided. Quota owners must be protected from unwarranted changes which directly affect their right. For example, if owners fear that new entrants will be granted a share of the TAC or that user fees or changes in reporting or enforcement requirements will be introduced ex post, the beneficial incentives of ITQs will be diminished.

In closing, I believe changes in the law to limit the application of ITQs would be counterproductive. While ITQs may not be suitable for all fisheries, restrictions on their use could prevent their adoption where they produce beneficial results. The Act and other applicable law already provide ample safeguards against the indiscriminate use of any management regime including ITQs. Councils should be able to consider the full range of management options so that they may have every opportunity to select the one which best achieves the purposes of the Magnuson Act.

Thank you for inviting me, and I will be happy to answer any questions.

[Statement of Mr. Anderson can be found at the end of the hearing.]

Mr. MANTON. Thank you, Dr. Anderson. Our next witness will be Mr. Dave Wallace.

STATEMENT OF DAVID H. WALLACE, JR., PRESIDENT, WALLACE AND ASSOCIATES

Mr. WALLACE. Yes. Thank you, Mr. Chairman. My name is David Wallace. I am here representing the Atlantic Surf Clam Ocean Quahog Ad Hoc Committee. We represent the majority of the processors in the industry and a large portion of the allocation holders of the industry.

The history of the surf clam industry is very interesting, in that back in 1972 we recognized that it was essential to control fishing of the resource. We had overfished the resource on a number of occasions, and it was absolutely necessary to control the harvest. We were working with the State and Federal program to try to facilitate this cause. The Magnuson Act in 1976 gave us the tool to implement a regulation. In 1977, the Surf Clam Management Act was the first federally managed fishery to go into effect. The fishery was based on a stringent quota based on the best scientific information available and maximum sustainable yield.

The fishery closures were implemented when the quota was caught; a moratorium on new entrants into the fishery, closed areas, restricted fishing times, and later a size limit. Overfishing of the industry at that time was restrained.

An amendment made to the surf clam management plan went into effect 3 years ago. It changed the system from a time-based allocation system to an individual transferable quota. A number of participants in the fishery, particularly the processors, opposed it. The changes in the management plan were dramatic from day one. In the first day, the fishing fleet was dramatically reduced and within 3 months had been reduced by at least 50 percent.

The consolidation of the fishery took out of the overcapitalization and built in efficiency. This all was accomplished without any cost to the government and helped control and support the quota within that system. There is no incentive for the participants to push for higher quotas when they can make a living, number 1, and, number 2, their vessels are fully employed.

The advantages of the ITQ system are major. First of all, you do not overfish the resource. Since the industry does not have excess capacity, then it is very, very positive for the owners of the allocation not to go for overfishing of the resource.

Under the time allocation systems, we went to a very stringent quota because the fish areas had been overfished, and the lower quotas allowed the resource to recover. The objective is for stability now and in the future. Under the time allocation system, the clam industry did not have any flexibility. When the resources changed, the regulations had to be adjusted. That was the reason for so many amendments to the FMP.

Under the ITQ system, we have a lot of flexibility in operating the business without government intervention. Thus, we do also not need any additional amendments to the surf clam ocean quahog management plan. The allocation owner's freedom to transfer allocation is its chief advantage. Today, more than two-thirds of all the clams are caught by vessels who have no financial connection with the owner of the allocation.

However, today we have a serious problem. NOAA general counsel has advised the industry that they are going to impose allocation sanctions on the industry. Today, the industry is in shock. The proposed allocation sanction, because there is no property right of this, then completely eliminates the possibility of being able to finance our allocation.

With an administrative change, the entire surf clam ocean quahog management plan has become untenable because the ability for small operators to be able to finance purchases of allocation have disappeared. Only large corporations can find the money outside of the system.

The typical clam operation trade is that the allocation is released to a processor, to another vessel owner, and then is caught by even a third vessel, the allocation owner not knowing who is even going to catch their allocation.

The reality of the system is that surf clam allocations and allocation sanctions are very detrimental to the system. We also have amendment 9 to the surf clam ocean quahog management plan. Amendment 9 takes away and undermines the system because it allows nonparticipants access to the fishery which undermines the very right of the allocation.

In conclusion, the facts are sort of simple. The National Marine Fisheries Service, because of its enforcement actions, has been

pushing for tighter and tighter controls when amendment 8 was designed to get the government out of operations. Now, we suggest that no fishery implement an ITQ plan until Congress decides if they want to have a situation where after the rules have been made the National Marine Fisheries Service steps in and changes the rules undermining the whole system and jeopardizing the welfare of all the participants. Thank you.

[Statement of Mr. Wallace can be found at the end of the hearing.]

Mr. MANTON. Thank you, Mr. Wallace. Our next witness is Mr. Wally Gordon, Mid-Atlantic Foods.

STATEMENT OF WALTER M. GORDON, JR., PRESIDENT, MID-ATLANTIC FOODS, INC.

Mr. GORDON. Thank you, Mr. Chairman. I first got in the clam business in 1980. Two years later, I formed Mid-Atlantic Foods for the purpose of canning clams, clam juice, and clam chowder. It is a family corporation, and I am the principal stockholder. We sell internationally, and we believe that we are probably the second largest supplier of canned clam products to the food service industry. We are located in Pocomoke City, Maryland. We employ 67 people, and we are a major employer in our community. Less than a year ago, we formed another corporation in New Bedford. We employ 50 people up there for the purpose of shucking and processing frozen and fresh clams.

I am a regional vice president and am on the Board of Directors of National Fisheries Institute, and I am an appointed member of the Industry Advisory Council to the Mid-Atlantic Fisheries Management Council. I wish that Congressman Young were here to hear me say that I also vote.

I can't tell you everything that is wrong with ITQs under amendment 8 in 5 minutes. I have opposed ITQs as implemented in the clam business from the beginning. I have always stood up and said I support independent fishermen, and this plan does not support independent fishermen.

When this was implemented, only one processor advocated this, and they stood to gain great allocations through vessels they owned. Most of the fishermen opposed this plan, and I am going to feel better after I tell you that this was crammed down our throats. The objectives of this, as they sold to us, was that this will (a) reduce the management costs and (b) get the government out of the clam business. To reduce enforcement costs, we were going to have people running around in Pintos checking the clam tags rather than having people at sea in helicopters and all that.

(c) It was to reduce the overcapitalization in the industry, and based on these three things, I have to tell you that this plan is a spectacular failure. NMFS just can't seem to let it alone. We still have at-sea enforcement, and I have heard several comments today about overcapitalization and this being reduced, and that is not the case at all. Certainly we have reduced overcapitalization in the fishing fleet, but for every dollar that we have taken out of the fishing fleet, we have turned around and put it back on the processors in the industry and on the American public.

And let me just tell you at today's prices what it costs me. Let me tell you what NMFS gave away. NMFS gave away $145 million worth of ITQs, and they *gave* it away. Now, that is what it would cost me at the prices I would have to pay today. A person that was given 1 percent of the surf clam industry at the prices I am paying can retire with $200,000 a year as long as this plan is in effect. He doesn't have to do a thing, and the American consumers are paying this bill.

Now, this money is not going back into habitat improvement. It is not going to stock assessment. It is not going to clean up the environment. It is going out of the industry. It is gone money. And how has that affected my business? My cost of ocean quahogs is up by a third. My cost of surf clams is up better than 50 percent. I am getting squeezed out of the EEZ clams. I can't buy them from the good suppliers that I have had over the years because of leveraging schemes by big corporations that come in and have the assets to buy the ITQs. I am being forced to use lower quality clams, and go further to get them. The quality of my product, and that is the way I built my business, is not what it ought to be.

And what has happened to my competitors? Well, the one processor that I told you was in favor of this has sold out and is gone. They are not even in the business anymore. And when they sold out their quota, all the big manufacturers (or other players that had money) were in danger of losing their supply. They were in danger of people coming in and buying their quota. So they said we better go out and buy these ITQs or we are going to be out of business.

The problem is that an independent processor like myself cannot go out and borrow the money to do it. Large corporations are the only ones that I am aware of that have been able to finance either directly or through loans that let people come in and buy these ITQs and then use them as leverage. Amendment 8 has also opened the way for foreign corporations, and they are doing it today, to come in and buy the rights to this American resource.

Now, the cost of ITQs to me as an independent processor is just ridiculous. It would cost me one and a half to two and a half times my annual gross sales just to go out and buy the right to buy or get the clams that I need. These are not bankable. When this thing first came in, there was a lot of talk about this being a property right, and it is not a property right.

A bank won't lend me 10 cents to buy allocation. A competitor who has money can come in and buy the allocation, go to one of my fishermen who has been fishing for me for years, and the man has ITQ to fish for 6 months of each year and he is out of ITQ. They would go to him and they say, "I will tell you what, Joe. You fish your ITQ, and you sell it to me, and I will let you fish an equal number of my tags, and you can fish your boat all year." Gentlemen, that is not a very hard decision to make at all. I know what I would do.

Mr. Wallace has talked about NMFS and continually tweaking the industry. You know, I will tell you every time I get a notice from NMFS that they are proposing something, I want to say, "Oh, no. Please don't help me again." And you have to stop messing with it. OK? And I am not here to tell you that ITQs won't work, but

I am here to tell you that ITQs in the surf clam industry won't work. The way they have been implemented in this surf clam industry is not right. It is going to lead to bigger businesses, and vertically integrated players and contract vessels.

And I see I am about to get electrocuted here, but I have eight quick things on one page, if I can finish. My recommendations, if you are going to use ITQs to manage the fishery: (1) They have to be bankable. And everybody here today is saying it is not a permanent deal. Well, if is not a permanent deal, it is not bankable. (2) It ought to have limited ownership. You talked today about 100 or 200 people in the halibut fishery. OK? I heard a comment made in the room earlier that five people control 90 percent of the quahog quota in this country. I would tell you that (3) I think that if you are going to own quota you ought to own a vessel. Maybe the vessel ought to be the one that owns a quota. OK? Let us put the men that have to send men to sea and have to take care of the boat—let us let them own the quota. (4) The value of these quotas ought to be in the right to fish, OK, free of government harassment and rules and regulations, rather than in the right to speculate on the value. (5) We need a method to prevent price manipulation. Currently, somebody can use or leave the clams on the bottom. You heard that one corporation owned 35 percent of the quota. If they don't use their quota, they can leave those clams on the bottom, and I can't get to them. I can run out in October and be sitting there waiting while they take my customers away because they have the allocation and I don't. (6) They need to be distributed fairly. It is a windfall profit to some and an undue burden to others. Perhaps you need to have some kind of an initial cost or something that would help set the market value on these ITQs.

And, last, they need to be suited to the fishery that they managed.

I thank you for hearing my comments.

[Statement of Mr. Gordon can be found at the end of the hearing.]

Mr. MANTON. Thank you, Mr. Gordon. Mr. Roger McManus, President, Center for Marine Conservation.

STATEMENT OF ROGER MCMANUS, PRESIDENT, CENTER FOR MARINE CONSERVATION

Mr. MCMANUS. Thank you, Mr. Chairman. I am the President for the Center for Marine Conservation. I am very pleased to be here with you today. Appreciating our time limitations this afternoon, I request that my full, written testimony and its attachments, which you have received, be included in the hearing record in addition to my comments now. This testimony is significantly less than that offered by Mr. Smith so I hope this will be all right.

I want to first emphasize that the Center supports the consideration of individual transferable quotas as a tool for limited access. Even its most ardent supporters, however, would constrain its application based on certain prerequisites and conditions for particular fisheries on a case-by-case basis. The Center's own policies regarding our determination whether to support or counter ITQ schemes are embodied in part in the materials included in my written testimony. I commend your attention, too, to our recent publi-

cation with World Wildlife Fund regarding limited access including ITQs as a reference during your deliberations on this issue.

Based on uncertainty about the status of ITQs as property rights, the Center opposed the Department of Commerce's recent final rule to establish ITQ systems on halibut and sablefish. Our concerns were based on widespread confusion concerning whether ITQs represent property rights or harvest privileges. Those concerns were addressed in NOAA's final rule in the letter to us from NOAA's Undersecretary, Dr. James Baker.

In part, Dr. Baker's letter reads that, "This Administration does not advocate privatization of public living marine resources. The establishment of ITQs does not confer private property rights." We agree with this policy and appreciate the clarity in which our concerns have been addressed. We would urge the Subcommittee and the Congress as a whole to affirm this policy through the process of the reauthorization of the Magnuson Act to guard against unnecessary future legal disputes regarding title to the public's marine fishery resources.

Nevertheless, we remain opposed to the November 9 rule at least until Congress moves to modify the Magnuson Act to ensure that the public is compensated by the fishing industry for its use of the public's fishery resources, particularly considering the windfall opportunities for quota holders and additional public management expense incurred because of the ITQ schemes.

The funds needed to administer ITQ schemes have to come from somewhere, and we are particularly concerned that they will come at the expense of other marine resource management needs. And I would add, Mr. Chairman, in my view, those fees need to go beyond simple management for that particular program. We are in the process here of providing a public resource for which the public should be compensated. Congress should make it clear to the Department of Commerce that it should wait until this body provides the Department with such authority before any further quotas are distributed or new ITQ schemes are adopted.

Speculation on the advantages of ITQs is just that, speculation. Like all seemingly good hypotheses, it needs to be tested and analyzed carefully before we rush to embrace it as proven theory. Perhaps the most lauded example of ITQ success stories is that of the wreckfish plan, but the most recent government analysis of that fishery basically concludes that the signs of hope for that plan cannot be attributed to the ITQ scheme. Moreover, the objectives for the plan largely address issues unrelated to the actual conservation and management needs of the stock.

Our concern is basically with those management needs, and I call your attention to NOAA's 1992 characterization of the status of the wreckfish fishery as fully utilized. But NOAA doesn't know its current potential yield, nor does it know its long-term potential yield. A more recent NOAA evaluation notes in part that the present scarcity of life history, fishing trend, and population level data argue strongly for a very conservative approach to the wreckfish fishery development and management.

In raising these concerns, I am not arguing at this time against the ITQ plan for wreckfish or even the careful development of such plans for other fisheries. But we need to proceed cautiously and

critically. By no one's estimation are ITQs the answer to our fishery management problems. The heart of these problems, at least for fisheries where fishing mortality is the major management factor, is the setting and enforcement of total allowable catch, TACs. We simply have not been conservative enough in our management practices. Billions of dollars are lost annually to the American economy because of the depleted status of our fishery resources, and that money signifies the loss of thousands of jobs and hardship on families. The history of our fisheries provides clear testimony to the fact that we have failed to manage these resources conservatively enough.

Congress needs to amend the Magnuson Act to ensure that TACs are set in a manner that will best ensure the long-term productivity and sustainability of our fishery resources. And parenthetically, I would argue, Mr. Chairman, that since Federal policy really has led to the mining of the fishery resources, we should consider seriously Federal policy to assist those people and their communities who are now suffering because of the resource losses, and I applaud the current efforts by NOAA to do just that.

Finally, Mr. Chairman, in all due respect, Congress needs to restrain itself from interceding in conservative management practices by NOAA. We need to resist running up our fishery resource credit card for good times now, to ensure stable times for the future. Thank you very much.

[Statement of Mr. McManus can be found at the end of the hearing.]

Mr. MANTON. Thank you, Mr. McManus. Our last witness is Mr. Rod Fujita. Am I pronouncing it right?

Mr. FUJITA. That is correct, Mr. Chairman. Thank you.

Mr. MANTON. Representing the Environmental Defense Fund.

STATEMENT OF RODNEY M. FUJITA, ENVIRONMENTAL DEFENSE FUND

Mr. FUJITA. Good afternoon, and thanks for inviting me to testify on ITQs briefly this afternoon. We have submitted more detailed written testimony for the record. My name is Rod Fujita. I am a marine ecologist with the Environmental Defense Fund, a nonprofit, nongovernmental organization that uses science, economics, and the law to create lasting solutions to environmental problems. EDF has six offices around the Nation and a quarter million members.

I think one's opinion on whether ITQs are a useful tool for solving fisheries problems depends to a large degree on one's diagnosis of the problems. What are the causes of the collapse of fishery after fishery in the United States? Bad judgment by fishery managers, greed, and even corruption have no doubt played roles. However, we at EDF believe that more fundamental economic pressures underlie the obvious and immediate causes. While a whole universe of complex factors motivates fishing behavior, we think it is undeniable that conventional open-access fishery management has created economic incentives to overfish, incentives too strong for even well-intentioned fishers and managers to resist.

Because our research indicates that ITQs replace these destructive incentives with incentives for stewardship, EDF has concluded

that ITQs represent a promising fishery management tool that Congress should support, though cautiously. EDF staff have recently authored a detailed report on ITQ-based fishery management. EDF's report, currently in draft form and being circulated for comment, elucidates the pros and cons of ITQs.

From our investigation, it is clear that ITQs eliminate the incentives to race for fish that you have heard so much about today, a destructive characteristic of open-access management. ITQs also create strong incentives among quota-holding fishermen to support management decisions that enhance conservation and stewardship. As a result, ITQs reduce pressure on managers to compromise the health of fish populations as to avert short-term economic crisis. ITQs achieve this result by increasing profits, stabilizing revenues, and increasing the predictability of management, and there is strong evidence that ITQs work in the real world, not just in theory.

Some of the failings that critics have attributed to ITQs are, in fact, failings that plague all forms of fishery management including inadequate enforcement, inadequate assessment, data-fouling, cheating, highgrading, and dumping. ITQs do appear to create incentives for highgrading, but it must be recognized that trip limits, commonly used to extend seasons under open access, also result in extensive highgrading.

EDF has concluded that many of the problems that have arisen in ITQ programs can be solved by carefully choosing fisheries for ITQ management and by better ITQ program design and implementation. ITQs are probably not suitable for all fisheries. Further, ITQ implementation in the United States should proceed only under a firm mandate to achieve maximum long-term conservation benefits and only with a much broader public involvement.

EDF strongly supports the legislative proposals of the Marine Fish Conservation Network for amending and strengthening the Magnuson Act. In addition to other proposals by the Network for needed reforms in this Act, we support the network's proposal to eliminate the existing prohibition against charging fees that exceed certain limited administrative costs. This amendment would allow the direct beneficiaries of fishery management to shoulder a fair share of the cost of research, management, and enforcement.

The amendment would also allow assessments on the economic or capital value of ITQs which should form the principal source of revenue to cover ITQ program costs. It would also enable regional fishery management councils to use auctions where appropriate in the initial allocation of quota shares.

Now, in conclusion, in addition to amending the Magnuson Act that we had proposed earlier in this testimony, EDF recommends that Congress take two specific actions to address ITQs. First, impose a temporary moratorium of one year initially on the initiation of new ITQ programs in U.S.-managed fisheries. Second, establish a carefully designed ITQ pilot study. These steps would allow fishery managers to learn from closely monitored experience with a limited number of new ITQ experiments as well as with those few that are ongoing in this country before the use of ITQs in the United States is allowed to expand further.

We suggest that Congress immediately convene an expert panel which includes conservation interests building on the team that produced the National ITQ Study report. This panel would establish the factors that should be considered in selecting fisheries for ITQ management and designing ITQ programs so that conservation benefits are maximized.

EDF's draft report on ITQs includes specific proposals for such selection considerations and design criteria, and other authors have made similar proposals, all of which could help inform the panel's effort. The panel should adopt preliminary guidelines as soon as possible and revise them periodically as more is learned from the ITQ pilot study. The guidelines would be used to establish pilot ITQ programs in several U.S. fisheries. The panel would evaluate the pilot study and the moratorium annually to decide whether to recommend to the Secretary of Commerce to extend the moratorium, lift it, or modify it.

ITQs are the most promising fishery management tool on the horizon. They will only be effective, however, within a framework that includes mandatory ecologically based TACs, aggressive fish population rebuilding targets, tough enforcement, collection of solid data on which management tools work and which don't, new protections for marine habitat, and continuing use of conventional tools like restrictions on nonselective and destructive gear. The link between a healthy ecosystem and a healthy economy could not be clearer than it is in the case of fisheries. ITQs could help us achieve both if they are carefully crafted. Thanks for the opportunity to present testimony.

[Statement of Mr. Fujita can be found at the end of the hearing.]

Mr. MANTON. Thank you, Mr. Fujita. We will now go to a round of questioning. Dr. Anderson, you argue that instituting fees on an ongoing system would unfairly destroy the capital value of quota holders. Do you believe the government is constrained from taking any action that would reduce the capital value of that benefit, why do you see fees as being unfair in this instance, and why do you feel they would destroy the capital of quota holders? It is a long question.

Mr. ANDERSON. Yes. Congressman, the key word in that question is on an ongoing system. As I said in my testimony, I am in favor of having fees on a program to get some of the—so you can compensate the public. The issue deals with the nature of the property right. If it is going to provide the incentives for conservation and for efficiency, it has to be a fairly stable right, and so I would say that, yes, go ahead and do it up front, but let people know that those taxes will be there. If some person goes out and buys ITQ under the impression that there are no fees, they are implemented thereafter, the discounted value of those fees will be—the reduction in the capital value of the asset will be equal to the discounted value of those fees.

And you specifically ask, is the government constrained from taking any action that would reduce the capital value? Obviously, it is not constrained from it, but I would caution against that because, again, one of the advantages of ITQs is a stable property right. So I would argue for everything possible to keep that right as stable as possible.

Mr. MANTON. Thank you, Dr. Anderson. Mr. Gordon, you may have already answered this in your testimony, but I am going to ask it again to make sure I fully understand your point. In your testimony, you estimate a new entrant into the fishery would have to spend $2.5 million for an ITQ. Similarly, you estimate the income a retired fisherman could get from the sale of his ITQ. How do you arrive at that estimate?

Mr. GORDON. Well, first of all, $200,000 a year, 1 percent of the surf clam quota, would be about 28,500 bushels. If you multiply that times the rental fees that are currently in the market range (anywhere from $7 to $8.65), you are going to come up with a number that is pretty close to $200,000 or far exceeds it. As far as my comment about $2.5 million, I tried to relate to you, gentlemen, what it takes to start out. A man comes out of high school and goes to work in the fishing industry. He starts out working on the deck of a vessel, and he works his way up through mate and captain, and decides one day he wants to buy a boat and be his own independent fisherman.

Before amendment 8 was in effect, he could go out and buy a boat, and he could buy one of the better boats in the industry for three-quarters of a million to a million dollars. We are on a time-based system, and you had the permits to go out and fish as much as you could fish during the allowable time.

Now, if he bought a boat—there were boats available for less than three-quarters of a million dollars—but he went out and bought a good boat, he should be able to fish about 35,000 bushels of surf clams in a year. You could fish 24 days a year, and it wasn't unusual for a boat to get 1500 or 1600 bushels on a trip, and if you multiply that times what the rights to the bushels are selling for today, and then add to that what he could catch with quahogs—he could go out and catch maybe 150,000 bushels of quahogs because they were not so much on a limited time—you could fish so it was just about 7 days a week—it wasn't unreasonable for a man to catch 150,000 bushels of those.

You multiply that times what quahogs and surf clams are selling for now, you get around $2.5 million. And that doesn't cover all the costs—he still has to go buy the boat. OK? All he has done is buy the rights. $2.5 million just buys him the right to go out and fish for the quahogs and surf clams and then sell the catch. Before, all you had to do was pay the three-quarters of a million dollars, and he got the licenses and everything, and it was up to him to go catch them in the allowable time.

Mr. MANTON. I think you also said that there is a concentration of 90 or 95 percent of the allocated ITQ shares in the hands of 100 individuals?

Mr. GORDON. I said I would hope there would be 100 individuals involved in this. I heard a comment in the room earlier that—I guess I am not really ready to testify to this, but it is very close to that—that 5 people own a very high percentage of the quahog quota. I mean, there was testimony——

Mr. MANTON. They get their ITQ shares by acquisition? After the quotas were set, they bought other people out?

Mr. GORDON. Some did. Some did. Some were given these allocations early on. They traded them back and forth amongst them-

selves, but any person that went out and bought surf clam allocation had to have some kind of financial backing. I mean, it is impossible for me as an independent processor to go out and buy allocation. I have tried to do it. I have tried to do it for 3 years.

I will tell you a quick story. I had a man—I kept him out of bankruptcy. His bank came to me and said, "Can you give this man market?"-a fishing man out of Ocean City, Maryland. I gave him market, and I let him fish for me for 4 or 5 years. He built himself a nice quota under this on both quahogs and ocean clams.

And when the time came and he got his allocation, he was getting elderly, and he was having trouble with his boat, and he came to me and said, "Mr. Gordon, I am going to get out of this." And he said, "You have been good to me, and you have been a good market for me, and I am going to give you first option on selling my boat and my quota." And he offered me the deal for $1.7 million for the boat and for the allocation that he wanted to sell.

And I went to my bank, and I said, "This has been a long-term supplier of mine, and I need to buy this out to protect my supply." And they said, "Wally, we are not going to lend you $1.7 million to buy a fishing boat and, by the way, what is an ITQ? You mean the Government can take it away?" And so consequently I lost that man as a major source of supply.

And it has not just happened once to me, it has happened a number of times because I don't have the resources to go to—another division of a corporation to draw on. I would buy it. OK? If the Government would lend me the money, I would spend $20 million today. I would sign my name to buy allocation. If somebody would lend me the money, I would put up everything I own to buy that. If you would tell me that you would not tamper with the rules, OK, and if you could lend me the money, I would go do that. I will play the game. OK? Let us just make it fair.

Mr. MANTON. And what you are saying is that banks don't recognize any intrinsic value in something that may very well be temporary?

Mr. GORDON. Not even after they stop laughing.

Mr. MANTON. Mr. Wallace, tell us about that amendment number 9 you referred to in your testimony. If I understand you correctly, it takes away council jurisdiction and gives it to the State of Maine. Is that some kind of parochial amendment that came from somewhere?

Mr. WALLACE. Well, yes. It is a secretarial amendment actually. The National Marine Fisheries Service wrote it. Just before amendment 8 went into effect, the Coast Guard happened to catch a number of Maine quahog fishermen fishing outside the 3-mile limit in the EEZ. The State of Maine had always advised the clam industry, the Surf Clam Ocean Quahog Management Plan Group and the National Marine Fisheries Service that these were in shore waters, clams, and that they were being caught in State waters only under the control of the State.

Through political pressure when the ITQ system went into effect, they were not allocated resource because, number 1, they didn't have permits which they could have gotten, and, number 2, they did not file the logbooks and report the clams as EEZ clams. If they had, they would have been allocated the resource. They have devel-

oped some political pressure. They today still operate in the EEZ. They catch clams under an experimental fishery outside of amendment 8.

This new system that was written will franchise them to be able to fish in the EEZ with no controls from the Federal Government other than the Federal Government authorizes the State to regulate the fishery. We feel that this is the classic example of a fishery that was overfished, was unregulated. Then when it collapses, they look to a regulated fishery that has shepherded their resource and have gone through all of the grief and aggravation of working at a lower cost or on lower allocations to rebuild the stocks. And we think that this is a very bad idea because once you start changing the system and amending the system, then the whole thing will just collapse.

Mr. MANTON. Thank you, Mr. Wallace. Mr. Fujita, you mention in your testimony that you think there ought to be a moratorium for 1 year on the establishment of ITQs. Tell us something about that proposal. Why 1 year? And the pilot program that you mentioned, should we legislate that or how would we get that underway?

Mr. FUJITA. The reason for a moratorium, in my view, is that there is considerable room for improvement in ITQ program design. Our concern is that councils are implementing ITQ systems for some of the wrong reasons. There is an excessive focus on increasing economic efficiency. There is an excessive focus on protecting fisheries resources from ITQ programs in other areas. ITA programs in Canada and the North Pacific, for example, provided much of the motivation for establishing an ITQ system for related fisheries managed by the Pacific Fisheries Management Council down south.

So we think that it is a good idea to wait for a while, look at what we have learned in the United States and around the world, and try to apply those lessons in a more systematic way to ITQ development in this county.

And the pilot program idea is a way to try to do that, rather than for NMFS or Congress to tell the councils that they must implement ITQs. The pilot program would provide some guidance. An independent panel would come together and specify what factors are important to consider when you design these ITQ programs and factor in the conservation benefits that can be attached to these programs. That is pretty much the concept that we envision.

Mr. MANTON. Thank you, Mr. Fujita. And I guess our last question to Mr. McManus is regarding bycatch. Now, what impact do ITQs have on bycatch, and what about highgrading under an ITQ regime? Is this a greater problem with ITQ systems than in an open-access fishery?

Mr. MCMANUS. Mr. Chairman, with regards to bycatch, I think the controversy about ITQs has illustrated in part that it is not a perfect solution for all fishery problems, and it is not going to address a bycatch problem unless we have specific incentives and efforts to reduce bycatch.

Now, earlier I think there were some good points made with regard to the fact that ITQs possibly can spread out effort and, therefore, make fishermen or allow fishermen to choose where and when

they are fishing more freely and thereby reduce bycatch in that light. So certainly they are not going to be racing as much and may be able to avoid as much bycatch. I don't think that is the total solution to bycatch, and we need to look at bycatch as a separate issue from that perspective.

With regard to—I am sorry—the second question?

Mr. MANTON. What about highgrading?

Mr. MCMANUS. Oh, highgrading. Well, as was pointed out earlier as well, highgrading is not a problem that is exclusive with ITQs. It can happen with limited trips or other limitations, but it is a problem, and it is a problem that is going to require enforcement. I find it very difficult in this hearing to hear very distinct differences of views about the costs of implementing ITQs. One of the costs will be a larger overall enforcement effort particularly with regards to highgrading, and that is going to have to be looked at very carefully in implementing these programs in the future.

Mr. MANTON. Thank you. That concludes our panel and all business of the Subcommittee for the day. I would ask unanimous consent that the hearing record remain open for submission of additional materials and responses to written questions members may have for today's witnesses. Without objection, it is so ordered. This meeting is adjourned.

[Whereupon, at 4:45 p.m., the Subcommittee was adjourned, and the following was submitted for the record:]

TESTIMONY OF
ROLLAND A. SCHMITTEN
ASSISTANT ADMINISTRATOR FOR FISHERIES
NATIONAL MARINE FISHERIES SERVICE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
U.S. DEPARTMENT OF COMMERCE

BEFORE THE

SUBCOMMITTEE ON FISHERIES MANAGEMENT
MERCHANT MARINE AND FISHERIES
MERCHANT MARINE AND FISHERIES COMMITTEE
U.S. HOUSE OF REPRESENTATIVES

FEBRUARY 9, 1994

Mr. Chairman and Members of the Subcommittee:

My name is Rolland Schmitten. I am the Assistant Administrator for Fisheries of the National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), U.S. Department of Commerce (Department). I appreciate the opportunity to appear before this Subcommittee to present the Department's views on Individual Transferable Quotas (ITQs).

I want to emphasize that I view ITQs as one of several available tools for use in the management and conservation of our Nation's fisheries. Should the affected fishing community seek to explore ITQs, the Councils should develop an appropriate ITQ program. If an ITQ-type program is desirable, the Department will lend its

full support and technical expertise to ensure that any such program will be effective in conserving the Nation's fishery resources, addressing the needs of the fishing industry, and producing benefits for the Nation. ITQ management has many positive features, and we support their use for certain fisheries.

The councils increasingly are choosing to control access to fisheries in order to discourage overcapitalization, which has eroded the economic benefits from many of the Nation's fisheries. In fact, many fisheries now are subject to some form of access control. However, the costs of implementing, monitoring, and enforcing ITQ programs are significant. Such costs, often several million dollars a year, cannot be absorbed, and the Department is reviewing proposals which would recover these costs from the beneficiaries of specific ITQ programs.

Background

We are witnessing a unique point in the history of the Nation's fishery resources and their management. While the President seeks to reinvent government, we, who oversee the management of our living marine resources -- resources that belong to the people of this Nation as a whole -- must seek new ways to manage those resources. More and more, fishery managers are forced to curtail and even halt fishing for many of our most important species. The time has come to discuss alternate management programs.

Ocean fish and shellfish are the last public resource that can be used for private gain by anyone who can obtain a vessel and the necessary gear. Because of a proliferation of vessels and gear,

including many "high-tech" improvements, traditional fisheries management has been directed to setting quotas, closed seasons and areas, fish size limits, and gear restrictions in attempts to conserve fish stocks. When fish stocks were large, relative to the number and technological prowess of fishermen, such direct output controls on the number of fish caught, and input controls on the efficiency of fishermen, were adequate. However, the value of fish in today's markets has attracted large numbers of technologically advanced fishermen into fishing on the same or even smaller stocks of fish. The result has been a race for fish, with entire yearly quotas of some species being taken in a few hours.

The halibut fishery off Alaska is the most dramatic example of this. Under open access, the fishing fleet grew from 2,900 vessels in 1981 to about 4,400 vessels in 1991, and the fishing season was compressed from more than 120 days in 1975 to one 48-hour opening with trip limits in 1992. Early investors have seen their profits diluted or eliminated by new entrants. The ultimate loser is the public who is forced to buy frozen halibut except for a few weeks a year, or to buy Canadian halibut offered year round under a new ITQ program.

New entrants to many fisheries have learned that the costs and returns that seemed so attractive when only a few were fishing will not support capital investments under a stampede of

fishermen. Meanwhile, the public spends more and more tax revenue simply to conserve and manage the fish under seemingly chaotic conditions. Managers are faced with pressure from financially stressed fishermen to increase quotas, relax gear restrictions, and allocate fish. At the same time, managers must exercise responsible stewardship.

One management scheme is to assign negotiable shares of the total allowable catch to individuals. These individual transferable quotas (ITQs) would be tradable in free and competitive markets, similar to land or business franchises. After an initial distribution of ITQs, the market would allocate fishing rights among individuals according to who could use them most efficiently. The adoption of ITQ programs represents a dramatic and fundamental change in U.S. fisheries management. This change is occurring in many fisheries world-wide.

Advantages and Disadvantages

There are a number of good reasons for fisheries managers to consider an ITQ system to allocate fishing privileges. On the face of it, an ITQ program would allow individuals to enter a fishery by purchasing ITQ, and then use the most efficient methods and times to take their share of the allowable catch. The race for fish would be reduced, fishermen would be free to match their investment in capital equipment with the quota shares held, and the extra capital could be employed in more productive

uses elsewhere in the economy. Fishermen choosing to leave the fishery will have the incentive and financial ability to do so through the sale of their quota shares. The sale of shares to other participants would reduce overcapitalization in the fishery. We would expect to see improved safety for fishermen, reduced gear loss and "ghost" fishing, better quality/higher valued products, more consistent availability in the market place, and reduced bycatch. Fishermen would also have a vested interest in protecting the fish and seeing their fisheries managed efficiently in order to maintain the value of their ITQ. Fewer and more refined rules would conserve the fish stocks. The public would benefit in the long run from lower management costs, more and fresher fish available, and a more efficient use of the human and capital resources available to produce fish and related goods and services valued by society.

Although this sounds good, it does not work for all fisheries. There can be complications that must be recognized and resolved before implementing an ITQ program, including initial allocations, government start up costs, and the need for improved enforcement. The initial allocation of rights to ITQs can be a contentious issue, because this allocation is a principal factor in determining the benefits to be realized by individual share holders in the early stages of implementation. Depending on how the initial allocations of quota are made, implementation of an ITQ system can initially be disruptive to participants and local

communities. Even the Federal government will be affected. It will need to modify and possibly increase its enforcement role, as well as efforts to monitor catches relative to individual quota shares, develop a registry and system of tracking ownership, and facilitate the sale or lease of quotas. The effectiveness of the program largely will be determined by the acceptance of the program by industry. Without the assistance of industry in accurately reporting landings and complying with the program, the system may become unmanageable.

NOAA has experienced indications of success in two ITQ programs implemented on the east coast, and now is in the process of implementing a third program in Alaska. The Mid-Atlantic Fishery Management Council developed, and the Secretary implemented, an ITQ system for surf clams and ocean quahogs in 1991. The South Atlantic Fishery Management Council has developed a similar ITQ system for wreckfish, implemented in 1992. Although it is still early in the implementation phase for both programs, overcapitalization in both fisheries has been reduced greatly. In the surf clam and ocean quahog fishery the total number of vessels operating in the fishery has declined from 131 in 1990 (the year before the program was implemented) to 63 vessels in 1993. The number of vessels in the wreckfish fishery has declined also, falling from 52 vessels that initially qualified for participation in the program to only 19 vessels during the 1993-94 season.

A less flexible transferable Individual Fishing Quota (IFQ) program for the fixed gear halibut and sablefish fisheries in Alaska has been approved and we have begun the activities necessary to implement the program. These fisheries will be much more difficult to manage because there are about 5,000 vessels operating in the two fisheries. I should also point out that all eight Councils are currently considering limited access programs of one form or another for many of our most important fisheries.

Although we often focus on the plight of individual fishermen or vessel owners in overcapitalized fisheries, we must not ignore the potential effects of ITQ-type programs on local communities that consist of homogeneous groups of small operators within relatively small areas with natural boundaries. These communities often are characterized by few available processing facilities, huge transportation costs to market, prohibitively expensive capital costs, and overwhelming competition from large vessels. Because of these conditions, fishermen located in some small communities can be virtually locked out of the fisheries under a purely competitive program. In such cases, it may be prudent to allow these communities, with their local operators, to participate directly in the management of the resource through allocations of community development quotas (CDQ).

Each year, a certain percentage of the total quota could be set aside as a CDQ, which in turn would be divided among eligible

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communities. Once a community is granted its CDQ, it is up to the community to distribute its quota share among local fishermen. Such a CDQ system has been employed in the Alaska pollock fishery of the Bering Sea and Aleutian Islands. During 1993, a community quota of 7.5 percent of the pollock total allowable catch was established and distributed among 6 eligible Alaskan community complexes. A similar community quota program was established in the recently approved IFQ program for Pacific halibut and sablefish fisheries off Alaska.

Changes in Current Law

Although the subject of a working group on fishery fees commissioned by this committee, we would highlight the need for legislative changes to provide authority for the assessment of fees. These fees could be used to support management needs to implement effective ITQ programs, such as increased monitoring of catches, systems for tracking ownership, and improved enforcement to ensure fair and effective management. Fees also could be assessed to recover economic rents from the use of these publicly owned resources, thus ensuring a return to the general public.

Challenges

The development and implementation of limited access programs pose significant challenges to the Councils and NMFS. The immediate challenge is to design systems that are both fair and equitable to the interested parties. Within this design, the

three most contentious elements are usually the initial allocation of quota, rules for trading, and rules that, if applied, would limit the consolidation of quota. Initial allocations must be developed in close consultation with the industry and may be based on historic dependence, equity, current investments, vessel size, auctions or lotteries. It is important to alleviate the concern that some will obtain disproportionately larger shares than others. It also is important to address the issue of whether crews as well as vessel owners have claims to quotas, particularly in fisheries where they bear a significant share of risk. The concern that fishing rights will be substantially redistributed or consolidated needs to be addressed by working with affected groups to define appropriate social and economic goals that will be met by restricting trading between regions, communities, gear types, or other appropriate units, if necessary.

The next major challenge is to design and implement systems for tracking landings and quota trading on a real time basis. If ITQs -- or any other quota system -- are to be monitored and enforced adequately and the participants are to be given as much flexibility as possible to manage their fishing operations, then landings against quota and quota transactions must be recorded instantaneously. Particularly in fisheries in which a large number of vessels operate, a system to facilitate the sale or lease of quota shares may also have to be developed. This

information should be freely available to members of the industry and owners of shares, and should provide a forum to bring buyers and sellers together to promote a free, competitive market for shares. One solution would be to use automated electronic data recording systems.

Similarly, there is a need for comprehensive and reliable software to enable timely access to selected data sets and summary information by fisheries personnel having a wide diversity of uses for the data (e.g., stock assessments, real-time quota monitoring, cross-validation, investigations, and enforcement activities).

The main challenge to NMFS scientists will be to improve the agency's research and stock assessment capability so as to increase the precision of existing assessments, to update existing assessments more frequently, and possibly to conduct assessments on a larger number of species not now done. In order to evaluate the success of ITQ management programs, it will also be necessary to provide for social and economic factor analyses and data collection programs.

Theoretically, ITQ systems should reduce the tendency toward overcapitalization, and should more closely match fishing capacity to the productive capacity of the resource. However, this will not happen if harvest levels routinely exceed the total

allowable quota because of violations of ITQs, if poaching by non-quota holders is not dealt with, and if highgrading or bycatch from other fisheries reduces the yield of the resource. For ITQs to achieve their conservation and economic objectives, enforcement must monitor compliance by individual quota owners or companies. A related challenge is to ensure that penalties for violations are sufficiently severe to act as deterrents.

Potential Burdens

If we are to meet the challenges of this new direction in fisheries management we must be prepared to accept the burdens that it will impose on both the Councils and NMFS. The task of sorting through numerous variations, options, and nuances of alternative limited access programs, not to mention other alternatives not involving limited access, can be almost overwhelming for the Councils. Similarly, NMFS's responsibilities for providing technical and scientific support to the Councils; implementing approved programs, facilitating their efficient operation, enforcing the programs to ensure their effectiveness, and providing oversight of program operation can be equally overwhelming. As I have already noted, real-time data collection programs, improved stock assessment capabilities, computer-based monitoring systems for tracking ownership, facilitation of sale or lease of shares and validation of catch reports, and improved enforcement to ensure compliance will be critical to success.

There are areas in which the Councils' and NMFS's management burdens will be offset or reduced. We anticipate significant reductions in micromanagement of the fisheries compared to levels required under current input and output management control programs. Responsibilities for allocation decisions by fishery managers will be greatly reduced or eliminated; conservation measures will be less complex; inseason management will be reduced; and we should see fewer fishery management plan amendments. In the long-term, we expect compliance from industry to improve, allowing a reduced enforcement effort. Smaller fleets will also reduce the enforcement burden. The long-term results should, in fact, be reductions in funds necessary to support such systems from the funding needed for initial implementation. Finally, our overfished stocks of fish should be rebuilt to healthy, sustainable levels, with the industry placed on a stable, positive position for the future.

Economic and Social Factors

I also would like to touch on some of the economic and social benefits and costs that are associated with ITQ programs. The economic benefits of using ITQs to allocate fishing privileges include the facilitation of entry into and exit from fisheries; fostering economic efficiency; creation of economic wealth; improvement in consumer-level quality and availability of fish; and, as we have noted in the long run, a reduction in the cost of managing fisheries from levels that would be necessary to

effectively manage under present management programs. Individuals would be free to enter a fishery by purchasing an ITQ, and then use the most efficient methods and times to produce their share of the allowable catch. Capital and human resources, both those remaining in a fishery and available to be redirected outside that fishery, could be employed more productively.

Wealth would be created as the reduction in cost of production is capitalized into the privilege to fish. As fishermen wish to leave a fishery, they would be able to liquidate their ITQ wealth and move on to other pursuits with a minimum of financial distress.

Since fish could be produced at times and in quantities suited to market demand, consumers would benefit from ITQ management. In the long run, the public would also benefit from more efficient management, more fish available, and a more efficient use of the human and capital resources available to produce fish and related goods and services valued by society.

The human or social element of the equation is of particular concern in developing and implementing any ITQ program. Social costs and benefits relate directly to the degree the management program dovetails with the socio-cultural norms and expectations of fishermen and coastal communities. These include recognition of historical and present participation in the fishery,

dependence on the fishery, active participation by fishermen in design of programs, and issues of fairness, equity in share allocation, and ability to participate in the fishery in the future. Where controlled access programs are proposed that recognize and account for these social factors, as required by the Magnuson Act, and involve fishermen in program development, NMFS has found the acceptance of the programs among fishermen to be high. Examples include the limited entry program for the Northwest Hawaiian Islands bottomfish fishery, the trap certificate program for spiny lobster off Florida, and the wreckfish fishery ITQ program of the South Atlantic area.

Many of the social costs associated with loss of employment and dysfunctional norms of behavior are not apparent to the fisheries manager; they are costs that are manifested in needs for increased social services, or to alleviate family and community dislocation. Social costs of controlling access to fisheries, including use of ITQ programs, are of two distinct types: there are those costs associated with reductions of employment opportunity and there are the costs associated with violations of cultural norms and expectations. Both loss of employment and perceived loss of employment opportunities affect the stability of local economies and social institutions, such as family and community. Employment loss may be unavoidable, but well-designed programs can maintain employment opportunities over the long term. For example, the requirement that permit holders be owner-

operators (spiny lobster fishery) or that those currently employed in the fishery have the first opportunities of receiving new permits (Northwest Hawaiian Islands bottomfish fishery) minimizes social costs associated with restricting entry to fisheries. Costs associated with violations of cultural norms are more diffuse, but equally real. Where regulations are seen to be "unfair" or "unnecessary," fishermen may tend to ignore or break them, thus increasing enforcement costs and further undermining the credibility of fishery managers. This dysfunctional social behavior exacts both economic costs (increased enforcement activities and failure to conserve stocks) and social costs. A breakdown of the socio-cultural basis for "law-abiding" behavior increases the likelihood of conflict among fishermen, and between fishermen and other sectors of the larger society.

On the other hand, where management programs take social factors into account, and are tailored to satisfy as many of these factors as practicable, while satisfying stock rebuilding and conservation goals, stability is enhanced in the social systems surrounding the fishery. Stable employment in the fishery and related industries offers social stability for families and communities. Of its very nature, controlled access, including ITQ programs, reduces uncertainty and risk in the fishery, while preserving the "fish-hunter" skills and enhancing independence prized by fishermen. Uncertainty is reduced in that competition

for fish is bounded; risk is reduced in that the fisherman can choose when and under what conditions, to fish. Under ITQ programs, capital investments in vessels and gear can be better tailored to the task of harvesting fish, while income can be maximized through better use of fishing time. This promotes further stability in the industry and community. Regulations that recognize a fisherman's perceptions of equity and appropriateness are easier to enforce and may be somewhat self-enforcing. Where utilized, the CDQs I spoke of earlier provide communities with the opportunity to co-manage the fishery and to develop local fishing activities in a way that satisfies local needs. All the above social benefits are further enhanced when fishermen, locally and regionally, are actively involved in the design of management programs and thus "buy into" the system selected. Good examples of this are the successful implementation of the Canadian halibut ITQ program in 1991 and the Florida spiny lobster trap certificate program in 1993.

In conclusion, ITQ programs can be a very useful tool to conserve and manage the Nation's marine resources. Although they are not a panacea, they do represent one approach that can address many of the problems that have developed under traditional open access management programs. While there are significant costs involved in developing, implementing, and maintaining these programs, these costs are not necessarily any greater than required by other effective management programs. In most fisheries, I

believe that over time the benefits will outweigh the costs. It is my hope that through better understanding and example, the "benefits" to be derived through ITQ systems as applied to fisheries "where the shoe fits" will lead to increased industry support.

Mr. Chairman, this concludes my testimony. I thank you for this opportunity to offer our views on this important issue. I would be pleased to respond to any questions you or other members of the Subcommittee may have.

Statement of Mark Lundsten
Fishing Vessel Owners' Association
Before
The House Subcommittee on Fisheries Management

February 9, 1994

Mr. Chairman,

Thank you for the chance to testify before you on IFQs today. My name is Mark Lundsten. I am the owner/operator of a 70 foot longline fishing boat, the Masonic, and am a Trustee of the Fishing Vessel Owners' Association. FVOA is a trade association based in Seattle of 80 hook-and-line fishing vessels that operate from California to Alaska.

I commend the Committee for focusing on IFQs. I am a professional fisherman but have spent a major effort in the last 6 years working to develop and pass an IFQ program for the halibut and sablefish fisheries off the coast of Alaska. In fact a proposal I submitted to the North Pacific Council in 1990 became the basis for the IFQ plan now being implemented in those fisheries.

The main reason I have supported IFQs is that I believe they will unsnarl the mess created by an overcrowded fleet in these two open-access fisheries. Traditional management measures have failed to achieve the conservation and management goals spelled out in the National Standards of the Magnuson Act. IFQs will give the industry and the government the tools to achieve these goals. As I have stated to the North Pacific Council before, I was not born endorsing IFQs. But I believe they are the best solution for these fisheries in the North Pacific. They are not a panacea nor appropriate for every situation. But they are a proven, workable solution for some fisheries problems and should be viewed as a viable management tool. To force them on any region or to delay any region from using them would be a mistake.

IFQs provide specific quotas of fish to particular individuals, those quotas based on historical participation in the fisheries and the prevailing condition of the resource. IFQs can be transferred, subject to conditions and restrictions calculated to achieve various management as well as social goals subject to conservation restraints. IFQ holders may harvest their quotas almost at any time, based on weather, markets, or any other business consideration. An IFQ plan protects the stocks of fish, promotes safety of property and life at sea, and maximizes the value of the product. If a problem arises in the system, the responsible fishery management council and the Commerce may adopt changes -

- or abandon IFQs altogether. Since IFQs do not convey property rights to individuals, but only harvest rights, there is no right to compensation to holders in the event that the system is changed or revoked. The public remains in full and effective control of its fisheries resources and the Secretary still controls harvest levels.

As with any management system, the Councils are responsible for management aimed at sustainable use of the resource. As long as they do that, the harvest of fish under IFQs provides economic benefits to a productive fishing industry while depriving the public of nothing and further, not requiring any special aid or buy-back programs. In fact IFQs provide the opportunity for the industry to consolidate itself at optimum levels, an "industry buy-back" with no need for any federal allocation of buy-out funds.

As I said, I put a lot of work into the establishment of an IFQ system for the halibut and sablefish fisheries in federal waters off the coast of Alaska. I did so because I hated to see a well-managed, professional industry of which I was proud to be a member be destroyed by inaction.

Before 1920, with the support of Pacific halibut fishermen, the governments of the U.S. and Canada organized the International Pacific Halibut Commission in order to study the biology of the halibut and set quotas that would ensure conservation of that resource. The fleets of both countries cooperated with the Commission and each other for decades, establishing a well-regarded model of successful fisheries management and fishing practices. The IPHC still functions today and the traditional halibut fleets of the U.S. and Canada have always been known for their professionalism.

By the early 1980's, with our growing population and the abundance of halibut, the fleet experienced a tremendous influx of new fishermen and consequently experienced severely shortened openings. In 1979, I worked 90 fishing days for halibut in the Gulf of Alaska and the Bering Sea. Last year I fished a total of four days for halibut in those areas. The resource is as strong as ever; the reduction in fishing time is the result of 4000-5000 boats entering the fishery.

Fortunately, we also have a sablefish resource - it was harvested by the Japanese in the North Pacific and was not "Americanized" until 1984. The traditional U.S. longliners displaced the Japanese from the fishery that year after we succeeded in harvesting most of the Gulf of Alaska quota. That newly domestic fishery saved the longline industry from part-time status with the development of new fishing ventures from Dixon Entrance to Attu Island.

Unfortunately, the same problems that plague the halibut fishery quickly overcame the sablefish fishery. By opening day, 1987, the whole edge (sablefish

live on the "edge" of the continental shelf where it drops steeply from 500 to 3000 feet), from Southeast Alaska to Unimak Pass, literally was full of vessels and their gear. No one had any more than a day's worth of room to fish. The problem has worsened in both fisheries since then.

The problems we face today are the result of an expanding population harvesting a finite annual resource: what some have termed the "tragedy of the commons." Everyone rushes to get his cow on the village green until the grass is gone and the cows are all starving. As long as there aren't too many farmers using the green, eveything's fine. But once one cow begins to go hungry because of overpopulation, the rush is on and the welfare of the green itself is forgotten.

In these two fisheries, the essential ingredient of our open-access system, and the tragedy of that commons, is waste. We waste our resources in our high-pressure fishing derbies in which the mentality is to "get yours." Clearly, when you have an overcrowded fleet on a discrete population of valuable fish, time and area closures and trip limits will not prevent overfishing and severe bycatch mortality. No incentive exists to be a steward of a target species or of marine birds or mammals or to avoid bycatch. We waste fuel, gear, bait, ice, and cold storage facilities by sending out way more boats than necessary and flooding the docks with fish in a ludicrously short time. We waste our markets with that glut of fish. Quality and prices suffer. The Canadian halibut, brought in systematically over eight months and marketed fresh under IFQs, is where the money is. Their halibut stocks are a fraction of ours but are almost worth as much to their nation because of IFQs.

Finally, and most tragically, we are wasting lives. The overcrowded open-access system forces everyone to push the limits of endurance and good sense every short season and results in too much loss of property and of life. Ten lives were lost in the 1992 halibut seasons and two more in 1993. I have been next to two boats that have sunk in the derbies and was the first on the scene of the rescue of the Majestic in September,1992, in the Bering Sea. No one was lost but all the crew were floating in their survival suits for six hours before being saved by a Coast Guard helicopter. For me, stopping this unreasonable "race for fish" and the treacherous conditions it breeds is the most essential reason for IFQs for sablefish and halibut.

I am not here as a missionary for IFQs. Each Council must be responsible for the conditions and demands of each fishery in each area. I do not think the halibut and sablefish IFQ program is necessarily any kind of model for any other situation. But traditional management is bankrupting these resources and punishing the fishermen in our area. After years of study and effort, I believe IFQs are the way to sustain both these fisheries.

TESTIMONY OF THORN SMITH, EXECUTIVE DIRECTOR

NORTH PACIFIC LONGLINE ASSOCIATION

HOUSE SUBCOMMITTEE ON FISHERIES MANAGEMENT

FEBRUARY 9, 1994

INDIVIDUAL TRANSFERABLE QUOTAS

Mr. Chairman, Members of the Subcommittee, my name is Thorn Smith - I am Executive Director of the North Pacific Longline Association, in Seattle, Washington. Our association represents the owners and operators of large freezer-longliners which fish for cod and other groundfish off Alaska with hook-and-line gear, processing and freezing their catch at sea. I want to thank you on behalf of the association for the opportunity to appear here today.

By way of introduction, I was a commercial fisherman and processor for a number of years before attending law school. I spent five years as a NOAA fishery attorney in Washington, D.C. and Alaska, and during my last year of federal service was the acting Chief of Fishery Management Operations at the NMFS Alaska Region. Since leaving NMFS/NOAA I have represented joint venture trawlers and crab fishermen at the North Pacific Fishing Vessel Owners' Association, served as president of a factory trawler company, and vice president of the American Factory Trawlers' Association. Now I represent longliners. It has been my privilege to attend nearly every meeting of the North Pacific Fishery Management Council since 1982.

Over the years the Council has struggled with limited entry issues several times. It has never been easy. It's not easy now. We have been discussing "comprehensive rationalization" of our

groundfish and crab fisheries for more than a year. At its meeting last month the Council voted firmly to put ITQ development on the back burner, and to move forward with a vessel moratorium and license limitation system - perhaps to be bolstered by a vessel buyback program (such programs are reported to have been used extensively, elsewhere).

Several votes confirmed this decision. First the industry Advisory Panel voted 17-2 for the immediate implementation of a moratorium on entry into the fisheries (the Council approved this two years ago). It recommended that NMFS move as quickly as possible to implement a license limitation program, while continuing to consider ITQ's (staff advised that the license limitation analysis could be available by April, and that an ITQ analysis would take "much, much longer and be vastly, vastly more expensive"). The Advisory Panel suggested that "harvest priority" (priority access for selective gear), full retention, and other bycatch management techniques could be used during, as well as after, a license limitation system. The Council then took four successive votes, considering the issue from every direction. Its decision held. The voting did not reflect an Alaska-versus-the-outside attitude. Groups from Oregon and Washington supported it, while the representative of the State of Alaska did not. Some people have expressed surprise at the decision. It did not come as a surprise to us, or to anyone who was listening carefully to the public testimony.

The Subcommittee has posed some specific questions on the use of ITQ's in fishery management. Before attempting to answer those

questions, I would like to address some of the themes which have emerged in public testimony on ITQ's in recent months - at the Council and at the Washington State Distant Water Fisheries Committee meetings. In our view it is largely these themes which led to the Council's decision.

INDUSTRY CONSENSUS

It has been chapter and verse - common knowledge repeated throughout our consideration of ITQ's - that there would have to be widespread agreement throughout the industry on the details of any ITQ system if it is going to be successfully implemented. Realistically, such consensus would probably have to extend beyond the industry. Environmental and public interest groups play a growing role in our deliberations. They are at the table.

No such consensus now exists. To the contrary, each of perhaps twenty special interest groups has developed and polished its own rationale as to why it should get the fish, and not the others. There is no agreement on a qualifying period. There is no agreement on how qualifying years should be "weighted." Shoreside processors want "processor shares." Trawlers don't. Skippers want "skipper shares." Few others do. Trawlers want no caps, or limits on ownership - the rest of us fear excessive consolidation. The list goes on and on. Whenever the Council brings these groups together they reach critical mass, and we witness the political equivalent of nuclear fission - the BIG BANG. They fly apart at warp speed, simultaneously chanting and believing their own mantras - it does not appear that there is enough political gravity in all the world to bring them together. In time two or more elements of

our industry may "cut a deal" and purport to represent the majority - but the likelihood of any true consensus embracing a broad range of interest groups seems remote. Absent such consensus, action on ITQ's will be difficult.

THE PROBLEM - OVERCAPITALIZATION

There is consensus regarding the problem. The problem is overcapitalization. Many investors made what in retrospect might be called bad business decisions. We built too many trawlers, too many longliners, too many pot boats, too many shore plants. Often these investments were possible only because of the participation of foreign banks. Some suggest that excess capital can be "squeezed out" of the industry through foreclosure and marshall's sale. Vessels which have been maintained properly may re-enter the fisheries at a lower level of capitalization - and turn a profit. Others which are heavily encumbered or which have suffered from deferred maintenance may simply disappear. The process is called risk capitalism.

WHO PAYS - THE BANKS, OR THE PUBLIC? WHAT'S IT WORTH?

Public interest representatives have raised a rather sensitive issue in this regard, as have some industry participants. Should the public give away its property - the fish - to secure the credit of those who made questionable investments? In a recent editorial one industry representative responded as follows: "The problem with factory trawlers is that they've built twice a many boats as have been justified, and they've created a very severe problem for this industry...they're driving ITQ's because it's one way to take a public resource and use it to get them out of their bad

investments." It is difficult to deny the veracity of this statement. It is also somewhat embarassing to admit the further truth - that others, such as longliners, pot fishermen and shoreside processors, have also overinvested. It has been observed in this context that we don't give old growth forests to lumber mills and lumberjacks - we auction crops of the renewable timber resource, retaining the permanent public property. Who takes the hit?

A corollary question has been raised - "Just how much are the fish and shellfish worth?" Some industry representatives have argued that the fish are worth approximately the amount of their investments - so that if the fish are given to the investors, the investors will be made whole. I asked an economist participating in the Council process how one might calculate the present value of an eternal stream of fish, given limited supply and growing demand. "It's incalculable," he said. "It's worth billions and billions." He muttered something about poor public policy...

THE MARKET MECHANISM; THE PRBLIC INTEREST; AUCTIONS

Those of the "hurry-up and give us ITQ's" persuasion argue that they need "the market mechanism" to "rationalize" the fisheries. It has been pointed out - again by public interest groups - that the public owns the fish. They ask why the market mechanism should not apply to the initial distribution of ITQ's, if such a distrubution takes place? Why shouldn't the public receive rents from its property? Why should the public permanently alienate its property? Why don't we auction the rights to take the fish, so that the public gets its due? Why don't we auction

temporary tradeable rights to take the fish, so that as the value of the resource rises we auction off the rights again, and the public receives increased rents?

The NOAA Office of General Counsel has advised that whereas auctions are not now permitted under the Magnuson Act, the Act can be amended - and that the current impermissibility of a measure which obviously addresses the problem at hand does not prevent its inclusion for analysis. It is obvious to editorial writers who review our circumstance that auctions make sense - please see appended written materials. It will be difficult to sweep this issue under the rug.

Nevertheless, the Council eliminated auctions as an alternative for analysis at the earliest possible point in its deliberations. Our association has consistently recommended analysis of the auction option - not because we want auctions, we don't - but because experience suggests that someone else will bring them to us unless we consider and reject them, satisfying the applicable standard of judicial review.

CONSERVATION CONSIDERATIONS

The environmental community has been quite vocal in expressing its dissatisfaction with the manner in which our fisheries are conducted today. Bycatch, bycatch mortality and waste are key issues. It is argued that we have no business perpetuating or institutionalizing wasteful fishing practices by giving the practitioners ITQ's. We should clean up our fisheries before considering privatization. Groups such as the Alaska Marine Conservation Council and Greenpeace have suggested that our current

priorites should be implementation of a moratorium on entry into the fisheries, and harvest priority for selective gear. A Magnuson Act amendment aimed at the reduction of bycatch, full utilization and the use of selective gear has been suggested. It is also recommended that we watch the implementation of the Sablefish/Halibut ITQ Plan for some time to determine whether we should proceed further with ITQ's.

FUNDING, IMPLEMENTATION, ADMINISTRATION, ENFORCEMENT; THE SURF CLAM QUESTION

It is widely stated that ITQ implementation is very expensive. Where will the money come from?

Our president sits on the industry implementation committee for the NPFMC Sablefish/Halibut ITQ Plan. He favors ITQ's as a management tool. Having witnessed the many unforseen problems which have come before the committee and the evident difficulty that NMFS is having in dealing with them, he has concluded that it would be absolutely impossible for NMFS to implement, administer and enforce a wider program including groundfish and crab. He firmly favors a moratorium on entry and a license limitation program for those fisheries, at this time.

You have heard, or will hear, testimony regarding the difficulty of enforcement of ITQ plans. At the recent annual meeting of the International Pacific Halibut Commission in Bellevue, Washington, Canadian halibut fishermen were highly critical of the planned enforcement of the Sablelfish/Halibut Plan. They feel among other things that there is simply too much coastline in Alaska to prevent the bootlegging of halibut.

Probably the most logical and effective way to address questions of administration and enforcement - and perhaps other important issues - is to examine the record of the Surf Clam/ Quahog ITQ Plan of the Mid-Atlantic Council. This program was initiated in 1990, and has enjoyed flagship status at NMFS. Dr. Lee Anderson, Chariman of the Council, has traveled far and wide extolling its virtues - we had the pleasure of hearing his presentation at the fist meeting of our Comprehensive Rationalization Committee.

In 1992 NMFS conducted an investigation of its implementation, administration and enforcement of the plan. On February 25, 1992 it prepared a report entitled, Review of the Effectiveness of Our Administrative and Enforcement Obligations Under the Surf Clam/ Quahog ITQ Plan. Pursuant to allegations of impropriety, the East Coast Fisheries Foundation, Inc., submitted a Freedom of Information Act request for "...all documents, reports, memoranda, notes, tape recordings, charts, graphs and other information in writing, on tape or electronic media (including floppy discs) resulting from a survey undertaken by your office and conducted by Ed MacLeod, Bob Ross, and Ken Beal in January and February of 1992." A thirty-two page report was released - but half of it was deleted under claim of FOIA exemption. Naturally this fueled the fires of suspicion. In a later unpublished letter to the Washington Post the Foundation stated, "Among the concerns raised in the notes and reports from that investigation were price-fixing, collusion, threats and intimidation, foreign ownership of the resource, conncentration and monopolistic control of the industry,

disguised ownership of quotas, inadequate enforcement and resource protection, and the loss of hundreds of jobs. What jobs were left for crewmembers paid half or less of their previous wages. Further, the investigators found that grave concerns regarding vessel safety had been voiced, and that vessels and lives had been lost as a direct result of the privatization policy implemented in 1990."

I have no personal knowledge of the surf clam fishery, or of the ITQ program. I have reviewed the NMFS report and associated documents obtained under FOIA, which are in the materials we have submitted to the Subcommittee for the record. If any of these allegations are true, or if there has been an attempt to hide the evidence obtained during the NMFS investigation, I think we're in deep trouble. The last thing we want is foreign ownership of ITQ shares, or concentration of shares in the hands of large domestic corporations - to say nothing of the other issues raised. Before any further consideration of ITQ's is undertaken, the Committee should obtain and make public all of the material requested under FOIA. If it is warranted, you may wish to take testimony from the investigators themselves. If there is good reason why this matterial cannot be released to the public, you may wish to pursue your own investigation behind closed doors. One way or another, this effort should take priority over all others - there is widespread concern about these matters.

CONCLUSION

We do not believe that it is feasible to design and implement an ITQ program without firm consensus among industry and other

interest groups concerning its details. That consensus is nowhere in sight. For the same reason, we feel that a "legislative fix" or an ITQ program designed by the Secretary of Commerce would be inappropriate.

Our association approves of the Council's decision to put ITQ's on the back burner. We agree that a moratorium on entry into the fisheries should be implemented immediately (the regulatory package is ready to go), and that a license limitation program should be implemented as soon as possible. We support the idea that harvest priority for selective gear and full retention/utilization measures should be implemented. Our harvesting techniques should be modified, where necessary, to avoid bycatch. We support the implementation of a vessel buyback program. We further agree that the Sablefish/Halibut ITQ Program should be implemented, and that we should study the results carefully before deciding whether to move farther with ITQ's.

We are not blindly opposed to the use of ITQ programs in fishery management, and could be supportive if conditions were right. There are many questions (above) which must be asked and answered before we will lend that support. In addition, we do not want to buy a pig in a poke - we will not approve some conceptual plan without knowing all of the gritty details, such as:

1. Exactly how much ITQ for each species will each vessel recieve;

2. Exactly what data (catch history) has been used for determining each and every vessel's share under a plan (full disclosure);

3. Exactly how much will it cost us - fees, taxes, auction or other purchases, etc.; and

4. What limitations will be placed on ownership (caps to avoid excessive consolidation), will foreign interests be able to control shares, to what extent will shares be fully tradeable?

SUBCOMMITTEE STAFF QUESTIONS

The Subcommittee staff has prepared some very good questions, which are difficult to answer at this point. Here are our attempted answers:

1. It is argued that an ITQ program would have the advantage that fishermen could take their catch at the time of their choosing, rather than being forced into a race for fish. That may be true. We are concerned that trawlers will still focus their efforts on spawning stocks - a practice which makes us uncomfortable. Possible disadvantages are mentioned above. We do not know whether ITQ's might prove appropriate for all fisheries. The NMFS report on the Surf Clam/Quahog Plan may enlighten us here. We would not look favorably on an attempt to separate pollock and cod from other species, for purposes of ITQ implementation;

2. It seems apparent that if ITQ's are to be employed and their implementation, administration and enforcement funded, the Magnuson Act will have to be amended to allow collection of fees in excess of administrative costs.

3. Don't know.

4. The major challenges in the implementation of new ITQ plans are stated at length above.

5. It is difficult to say whether ITQ's will increase or

decrese the management burden on NMFS. Let's study the Surf Clam/Quahog and Sablefish/Halibut Plans, and find out.

6. Again, we should study our own plans already in effect to determine economic and social costs and benefits of an ITQ management system - there is no need to go to New Zealand.

Thank you for the opportunity to speak to these issues. I respectfully request that the materials which we have provided in support of our testimony be made a part of the record of these proceedings.

STATEMENT OF FRANK DULCICH
ON BEHALF OF THE PACIFIC PROCESSORS ASSOCIATION
BEFORE THE
SUBCOMMITTEE ON FISHERIES MANAGEMENT
COMMITTEE ON MERCHANT MARINE AND FISHERIES
U.S. HOUSE OF REPRESENTATIVES

FEBRUARY 9, 1994

Mr. Chairman and Members of the Committee:

I am Frank Dulcich, President of the Pacific Group of seafood processing companies and President of Pacific Processors Association, which represents all major seafood processors in Washington, Oregon and Northern California. Collectively, Pacific Processors Association represents some forty processing plants, employing up to 10,000 people on an annual basis in communities from Bellingham, Washington to San Francisco, California.

The seafood processing community is very concerned about the proposed use of Individual Transferable Quotas (ITQs). Certainly, the experience that others have had with ITQs both in this country and elsewhere, dictate the need for a very thoughtful, well-informed and deliberate approach to this controversial issue. Our Association has researched this issue carefully. We have met with Dr. Russell Harding, who both managed New Zealand's ITQ program for many years, and has worked with the North Pacific Fisheries Management Council in the development of the halibut and sablefish ITQ programs in Alaska. In addition, many of our member processors operate processing plants in Alaska, and consequently, are familiar with the Alaska ITQ program.

Based upon our experience, our discussions and our research, the Pacific Processors Association is convinced that an ITQ program, in order to successfully achieve its intended goals and objectives, must be structured so as to minimize the inevitable adverse economic, social, environmental, and cultural consequences its adoption can bring, particularly if instituted, as proposed, on a pilot program basis.

While we have many concerns regarding ITQs, we have identified four (4) general concerns attendant to the adoption of ITQs that we believe must be addressed to insure such a program will minimize adverse consequences, promote conservation and protect fishing-dependent communities and jobs, thereby furthering the purpose behind the Magnuson Act:

(1) Industry Concentration and Market Power. Both the New Zealand experience and common sense indicate that, without restriction on quota ownership, ownership will be concentrated among a handful of wealthy and powerful vessel owners or corporations. This is precisely what happened in New Zealand and, apparently, is

precisely what at least one powerful seafood company expects to occur if and when ITQs are adopted in this country. Ronald Jensen, Senior Vice President with Tyson Foods, owner of the largest factory trawl fleet in the country through its wholly owned subsidiary, Arctic Alaska, so testified before this Committee on August 10, 1993 at a field hearing in Portland, Oregon. While Tyson/Arctic Alaska's specific intentions are unknown, New Zealand's ITQ experience suggests many fishing-dependent communities throughout the country may suddenly find themselves without a processing plant, without processing jobs and, perhaps, without a fishing fleet. A few powerful corporations owning large amounts of quota could easily decide it is in their economic interests to concentrate processing at sea or in a handful of existing ports. The economic, social and cultural consequences of this very real scenario must be recognized and addressed.

It was precisely to avoid the spectre of such enormous economic and social displacement that Alaska restricted quota ownership in its halibut and sablefish fisheries to small fishers. In addition, by requiring the preparation of a comprehensive Environmental Impact Statement (EIS), to identify not only the environmental, but also the economic and social impacts and alternatives to the proposed ITQ adoption, the North Pacific Fisheries Management Council further restricted the amount of fish processed off-shore, thereby protecting coastal communities and the jobs associated with on-shore processing in those communities. Similar safeguards are essential to protect fishing-dependent communities elsewhere, as well as the small and medium-sized processors, from the predictable economic devastation that could otherwise result.

(2) Community Development Quotas. The State of Alaska has further acted to protect additional fishing-dependent communities and native communities by the adoption of community development quotas in some fisheries. Pacific Processors Association believes the adoption of community quotas generally could go a long way toward minimizing the economic and social displacement that would otherwise be certain to occur. Community quotas do not restrict quota ownership to fishers, but would help to insure that coastal communities, most of which are small with narrow, fragile economies and seasonal unemployment are protected under the Act. Without seafood processing, many of these communities would be forced to rely primarily on tourism for their economies and its seasonal low-wage service-oriented jobs. Significantly, much of the tourism and related jobs are dependent upon the existence of the commercial fishing activity in those communities and the charm of a small coastal town, a working waterfront and the availability of ocean fresh seafood.

Because community development quotas have been successfully used in other fisheries, a potential blueprint for their adoption nationally already exists. Eligible communities could be asked to prepare a development plan explaining how they intend to use their quota. The plan could then be reviewed by appropriate regional

management officials in conjunction with other such applications to determine whether or to what extent approval of the quota should be granted. Other variations on this idea undoubtedly exist, but the central importance of minimizing economic and social displacement by protecting traditional fishing-dependent communities must be recognized.

(3) Pilot Program Costs. Piecemeal experimentation with ITQs is costly. Not only can the cost of ITQ management in selected fisheries exceed the ex-vessel value of those fisheries, but there can be tremendous displacement of boats and fishers from ITQ fisheries to other fisheries, leading to further problems with over-fishing and over-capitalization in the non-ITQ fisheries. Moreover, many boats and fishers will opt to relocate to other geographic areas. We, on the Pacific coast, have already seen this as a result of the imposition of restrictions on the offshore pollack catch. Alaska-based boats have decided to head south to the Pacific Northwest, thereby intensifying fishing efforts locally and exacerbating an already acute problem caused by over-capitalization as a result of displacement from coastal salmon fisheries.

(4) Resource-Rent/Associated Fees. The adoption of an ITQ program effectively privatizes a public resource. Public policy and simple fairness dictate that the owners of this public fishery resource; i.e., the public, must derive benefits from its exploitation. In order to insure costs associated with effective fisheries management and enforcement are available, monies received from purchase of quota should be earmarked for fisheries management and research, and not permitted to be used for non-fisheries purposes.

CONCLUSION

Frankly, we would prefer that the acknowledged concerns with over-capitalization and over-fishing be dealt with through less restrictive measures, like limited entry programs and increased enforcement. We understand, however, there is considerable support for adoption of ITQs both regionally and nationally. If the decision to adopt ITQs in some form is made, we request that before such a system is adopted, that a comprehensive environmental impact statement be performed for each fishery in each management region so that the full consequences of the use of ITQs can be identified, including the economic and social impacts, so that alternatives can be explored and, most importantly, so that those communities, businesses and individuals who will be most affected by the adoption of an ITQ system will have an opportunity to participate in the decision-making process.

Following the preparation of such a comprehensive impact statement, the Pacific Processors Association requests that any ITQ system proposed for adoption be conditioned upon the protection of traditional fishing-dependent communities and the thousands of jobs provided by the small and medium-sized processors located in those communities.

Finally, if this Committee intends to conduct further hearings on this critical issue, we request that consideration be given to allowing a member of the seafood processing community from the Pacific West Coast to appear and present testimony. Industry consensus is imperative for any comprehensive fisheries management scheme to succeed. Many seafood processing companies are headquartered in the Seattle area, but have all their processing facilities located in Alaska. Seafood processing companies located in the West Coast states represented in the Pacific Fisheries Management Council are frequently neglected because of the failure to appreciate the distinction between location of headquarters offices and location of processing facilities. All affected regions and all affected segments of the industry must be involved in the debate over ITQs.

Thank you for the opportunity to provide written testimony. Please do not hesitate to call me or any of the undersigned individuals or the Association's counsel, Thane Tienson, if you have any questions.

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Jere T. Murray, Ph.D.
Seldovia, AK.

Mr. Richard Lauber, Chairman
North Pacific Fisheries Management Council
Dear Sirs;

October 16, 1993

re: The North Pacific Fisheries Management Council(NPFMC) *Allocation of Fishing Privileges to on-shore operations* in the Halibut and Sablefish Individual Transferable Quota(ITQ) Fishery Management Plan

NOAA General Counsel--Alaska Region in its opinion of 9/20/93 summarized: "The Councils and the Secretary also have the authority to limit access to one or more fisheries. Access to these fisheries is limited by the allocation of fishing privileges."(p2-2)

"The only specific reference in the Magnuson Act for allocating privileges appears in subsection 301(a)(4), or national standard 4."

National Standard 4 states: Any fishery management plan prepared, and any regulation promulgated to implement any such plan, pursuant to this subchapter shall be consistent with the following national standards for the fishery conservation and management:

... (4) Conservation and management measures shall not discriminate between residents of different States. If it becomes necessary to allocate or assign fishing privileges among various United States FISHERMEN, such allocation shall be (A) ...to all such FISHERMEN;...."(emphasis added)(16 U.S.C. 1851(a)(4).

Halibut are not covered under the Magnuson Act, being the subject of treaty and international protocol, but are covered under the 1982 Halibut Act. Limited access under the Halibut Act is regulated by : "...if it becomes necessary to allocate or assign halibut fishing privileges among various United States FISHERMEN...." (HALIBUT ACT OF 1982, P.L. 97-176, 97 stat. 79 Sec. 5 (c))

To determine what privileges are available for allocation and to whom it is legal to allocate those privileges one must look to the definitions. Magnuson Fishery Conservation and Management Act, Sec.3, definitions:

(10) The term "fishing" means--

(A) the catching, taking, or harvesting of fish;

(B) the attempted catching, taking, or harvesting of fish;

(C) any other activity which can reasonably be expected to result in the catching, taking, or harvesting of fish; or

(D) any operations at sea in support of, or in preparation for, any activity described in subparagraphs (A) through (C) (emphasis added)

Such term does not include scientific research activity which is conducted by a scientific research vessel.

(11) The term "fishing vessel" means any vessel, boat, ship, or other craft which is used for, equipped to be used for, or of a type which is normally used for--

(A) fishing; or

(B) aiding or assisting one or more vessels at sea in the performance of any activity relating to fishing, including but not limited to, preparation, supply, storage, refrigeration, transportation, or processing.(emphasis added)

In the September 20,1993 NOAA General Counsel-- Alaska Region opinion, it is pointed out that the Magnuson Act only permits allocation to "harvesting activities and operations at-sea in support

of or in preparation for harvesting activities." That opinion follows an earlier NOAA opinion that expanded the definition of "fishing" by assuming 'at-sea operation' would include supply, transportation, and processing operations. However, definition 11 in Magnuson clearly delineates that supply, transportation, and processing are not fishing. Since only fishing privileges can be assigned and only to fishermen, an Individual Processing Quota(IPQ) system is not authorized under the Magnusón Act, nor are such "at-sea transshipping privileges and at-sea supplying privileges" that were purported in that NOAA opinion. The issue becomes slightly cloudy since the 1978 House Appropriation Committee contemplated changing definitions of fishing and processing based on the faulty NOAA opinion. No change or clarification in either definition was made. The question then becomes: does the explicit distinction between fishing and processing in the Magnuson Act passed by the full congress or the contemplated redefinition by a committee govern Council and Secretary actions? We believe the explicit distinction incorporated into the actual law clearly prevails.

The most definitive point of these opinions is that allocation can only be made consistent with National Standard #4 and the Halibut Act, which call for allocation to be "among fishermen". Neither Act provides an explicit definition of 'fisherman'. Within the acts we must extrapolate the definition of 'fisherman' from the definition of fishing, and the logical conclusion is that a fisherman is one who engages in fishing or as Webster defines: "One whose occupation is to catch fish."(Webster's New Collegiate)

Under both Acts, allocation of fishing privileges must be to fishermen and cannot be to any on-shore support activity. The allocation of fishing privileges to on-shore activities would, in the words of the 1993 NOAA opinion, "be an invalid extension on the Councils' and the Secretary's statutory authority."

The NPFMC in its Individual Transferable Quota plan for halibut and sablefish did allocate fishing privileges to the on-shore activities of financial investment and ownership. The agency clarified its rationale for this allocation in response #12 to NEPA comments (FEIS page 12, appendix E) that the risk to financial investment was the basis for such allocation. Clearly, some onshore processors, individuals, corporations, and ownership trusts that do not go to sea or provide at-sea operations will be allocated halibut and sablefish fishing privileges based on their financial investment and ownership in violation of National Standard 4 and the Halibut Act of 1982.

The statutory authority for assigning fishing privileges is specifically limited to: - allocation to fishermen and even the broadest expansion of the Magnuson Act definition of 'fishing' requires at-sea support. The NPFMC has conducted an "invalid extension on the Councils' and Secretary's statutory authority" in its establishment of a non-fishermen class as the recipients of the assignment of fishing privileges.

We hereby request that the Council follow the NOAA General Counsel opinion delineating the Council's authority in this matter, request referral of the regulations back to the Council, and cease the analysis of on-shore class allocation in any other IFQ plans.

Sincerely,

page 2

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02/04/94

U S HOUSE OF REPRESENTATIVES
COMMITTEE ON
MERCHANT MARINE AND FISHERIES
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WASHINGTON DC 20515-6230

HONORABLE THOMAS J. MANTON, CHAIRMAN

MY COMMENTS HAVE TO DO WITH THE UNFAIRNESS OF THE ITQ IN THE SURF/QUAHOG PLAN BY THE MID-ATLANTIC COUNCIL.

THE ALLOCATIONS WERE GIVEN TO VESSEL OWNERS FREE. NO CONSIDERATION GIVEN TO SHUCKING PROCESSORS. PUTTING SMALL FAMILY OPERATIONS OUT OF BUSINESS. LARGE PROCESSORS WITH STRONG FINANCIAL BACKING WERE ABLE TO BUY ITQ AND LEASE THEM. GIVING THEM THE ADVANTAGE TO CONTROL THE INDUSTRY. FORCING SMALL PROCESSORS OUT.

ITQ'S WERE AWARDED TO VESSELS AND OWNERS WHO WERE SMUGGLING DRUGS ON CLAM VESSELS. THIRTY FIVE PERCENT OF THE ALLOCATION IS CONTROLLED BY TWO MEN WHO WERE CONVICTED AND SENTENCED. ONE TO 8 YEARS, FEDERAL PRISON. ONE TO TEN YEARS, STATE PRISON.

THE NATIONAL MARINE FISHERIES LOANED ONE OF THE CONVICTED DRUG SMUGGLERS SEVEN MILLION SIX HUNDRED THIRTY ONE THOUSAND DOLLARS OF U S GOVERNMENT MONEY TO EXPAND HIS VIRGINIA BUSINESS. AND TO FREE UP OTHER CASH HE HAS TO PURCHASE ITQ'S.

ITQ DOESN'T WORK. THE FEDERAL GOVERNMENT GAVE AN AMERICAN RESOURCE OWNED BY THE AMERICAN PEOPLE TO A MINORITY FOREVER.

QUOTA WITH A GOOD CONSERVATION PLAN SHOULD HAVE BEEN IMPLEMENTED SO ALL AMERICANS COULD HAVE THEIR SHARE.

RESPECTFULLY,

Lance G. Fisher

LANCE G. FISHER

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INDIVIDUAL FISHING QUOTAS FOR HALIBUT AND SABLEFISH FISHERIES OFF ALASKA: NOW WE BEGIN

Presented at the Fish Expo Seminar
"Who Gets What? IFQs in the North Pacific"
Seattle, WA, October 21, 1993

by Jay J. C. Ginter
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Introduction

Individual fishing quotas or IFQs are a relatively new addition to the fishery manager's kit bag of management tools. Such limited access systems, also known as individual transferable quotas (ITQs), have been seriously considered by fishery management authorities only since the late 1980s. The North Pacific Fishery Management Council began a detailed assessment of IFQ options as an alternative to traditional open access management in 1990.

In the beginning, there was the question, what is an ITQ system and why is it considered? The Council had few models from New Zealand, British Columbia, and the Mid-Atlantic states, to cite a few examples. Analysts working for the Council then started to work on the question, what will happen if an IFQ or ITQ system is implemented in the sablefish and halibut fisheries? Now, with such a system approved by the Secretary of Commerce, I am here to answer the question, how the National Marine Fisheries Service intends to implement the IFQ program for halibut and sablefish off Alaska. Also, I would like to tell you about the progress we have made so far.

Basic Background

First, I'd like to give you some basic information that indicates the magnitude of the fisheries that will be managed under the IFQ program. In 1993, the total catch limit for the commercial halibut fishery in areas 2C through 4E was 43,240,000 pounds. The total allowable catch of sablefish by longliners this year in the Bering Sea and Aleutian Islands area was 5,952,000 pounds and in the Gulf of Alaska it was 39,921,000 pounds. All together, if the IFQ program were in effect this year, it would have applied to fisheries for slightly more than 89 million pounds.

Annually, there are about 1,500 fishermen that participate in the halibut fishery and about 750 vessels permitted to operate in the sablefish longline fishery off Alaska. However, our

records indicate that about 6,600 vessel owners will qualify for an initial allocation of quota share (QS), and we anticipate about 8,000 to 10,000 applications for QS. This will be the first ITQ program that NMFS will implement in the Pacific, and it is significantly larger than the two ITQ programs currently being managed by NMFS on the Atlantic Coast.

Basically, there are four parts to implementing the halibut/sablefish IFQ program: (1) regulations, (2) initial allocation, (3) quota share and IFQ transfer, and (4) catch monitoring.

Regulations

The final implementing regulations are scheduled to be published soon in the Federal Register. After they are published, copies of the regulations will be available from my office, the Fisheries Management Division, Alaska Region, NMFS, in Juneau Alaska. Although we refer to these as the final regulations, they do not signify the end of the regulatory process. Indeed, this is perhaps just the beginning. At its meeting last month in Anchorage, the Council approved a quota share block proposal. If approved by the Secretary of Commerce, the "block proposal" will require small initial allocations of quota share, those that result in IFQs of less than 20,000 pounds the first year, to be transferred as a unit or block. Before this would come into effect, there will be opportunity for public comment on a proposed rule followed by publication of a final rule, again if approved by the Secretary. In addition, we are preparing regulations to implement an appeals procedure. Again, there will be a proposed rule published and a public comment period on the appeals regulations before they are made final.

The IFQ program is likely to be a source of constant public debate for several years as fishermen, processors, the Council and NMFS gain experience with its strong points and weak points. We expect to be making regulatory changes to the program based on this experience for the foreseeable future. This evolution of the IFQ program makes the regulatory process an integral part of IFQ implementation.

Initial allocation

The initial allocation of fishing privileges is usually the most contentious part of any limited access system, and the IFQ program is no exception. As developed by the Council, basic eligibility for an initial allocation of quota share requires ownership (or lease) of a vessel that made landings of halibut or sablefish caught with fixed gear any time during the period 1988, 1989, or 1990. If you pass this test, the next question is how much quota share will you be allocated? The amount of quota share allocated is based on a your five best years for halibut

during the period 1984-1990, and for sablefish during the period 1985-1990. The amount of halibut or sablefish that you can harvest in any one year in an area, your IFQ, will be based on your quota share, relative to the total of everyone's quota share for that area, and the total allowable catch for that area. So fishermen who are allocated larger quota shares will receive larger IFQs.

Fishermen will have to apply for an initial allocation of quota share. There will be only one application period for quota share, but it will be a period of about six months and it will be well publicized. In preparation for this application process, we have assembled a database of over 300,000 records based on Alaska, Washington, and Oregon fish tickets.

An application for an initial allocation of quota share will be sent to anyone who completes an application request form. The application will include a summary of all landings data that State and Federal confidentiality rules will allow us to give to the person who requests an application. If you request an application and we have no landings data in our database for you, or the halibut and sablefish landings recorded from your vessel are in another person's name, then you will receive an application with no data summary. You may then fill in your application with the data that you believe to be correct and attach copies of fish tickets to support your landings claim and return it the Alaska Region, NMFS. I should emphasize that the burden of proof will be on the fisherman who claims that his catch and vessel ownership history is different from what our records indicate.

If you do not have copies of fish tickets that another fisherman signed on your behalf, then you can submit a data release form signed by the other fisherman that will enable us to release his landings data to you. Fishermen who leased a vessel during the qualification period also will have to provide evidence of that lease by submitting a lease contract or affidavit attesting to the lease signed by the vessel owner and leaseholder. If additional evidence is requested by NMFS to support your claim of halibut or sablefish landings, vessel ownership, or lease, then you will be provided one opportunity to submit corroborating documents within 90 days. Any subsequent dispute over a quota share application may be appealed.

All uncontested quota share for each management area will be assigned to a quota share pool for that area. Calculations of IFQs will be based on individual allocations of quota share that are in the quota share pool on a specified date near the beginning of the fishing year. Quota shares that are being contested will not be in the pool and no IFQ will be issued for them for that year, so it will be to your benefit to resolve your quota share disputes as quickly as possible.

Our current plan is to begin the quota share application process early next year. Initial allocations of quota share may be appealed during a 90-day period following the issuance or denial of a quota share allocation. The application and appeals process will take most of 1994. The initial issuance of IFQ would occur, according to this schedule, in February of 1995, and fishing for sablefish under the IFQ program would begin in March of 1995 and continue through November. The IFQ fishery for halibut should have the same season, however, this decision must be made by the International Pacific Halibut Commission.

Quota share and IFQ transfer

Buying and selling quota share and IFQ will require another application process in order to enforce the IFQ policy. This policy, for example, does not allow transferring quota share between areas and between vessel categories. A person may not receive quota share if he already possesses more than a specified maximum amount, basically one-half percent of the total halibut quota share or one percent of the total sablefish quota share. Catcher vessel quota share can be transferred only to "IFQ crew members" who have at least 150 days of experience in commercial fishing in the US. Limitations also will pertain to the transfer of IFQ depending on the vessel category to which it is assigned. In short, we will have to determine whether a person is eligible to transfer or receive quota share or IFQ before that transfer can take place.

Applications for transfer of quota share and IFQ may be submitted any time but will not take effect until approved by the Director of the Alaska Region, NMFS. To make this process as efficient as possible, we will be developing another database of persons eligible to receive quota share or IFQ and a computer system to track transfers.

Catch monitoring

There is no question that the IFQ program will require a more sophisticated catch reporting and monitoring system than we currently have. To prepare for this, we are planning to develop an electronic reporting system that will operate similar to a credit card or automatic teller card. Basically, fishermen will be issued an IFQ card if they have an IFQ allocation. The card will have coded information that will be read by a machine. A landing of IFQ halibut or sablefish will be recorded by entering data into the machine and the quota share holder's account for which the card is issued will be automatically debited. Such landings reports will probably not replace the current fish ticket reports, but we are hopeful that reports of all catches will be electronically transmitted in the future.

In addition, to improve our monitoring capability, fishermen

will be required to give us prior notice of their intent to land any IFQ fish. Landings of IFQ fish will be allowed only to registered buyers who must apply for and hold a registered buyer's permit. Registered buyers must report landings within six hours of the landing and before shipment. The regulations also will provide for shipment reports and control transshipment between vessels and dockside sales.

Enforcing the integrity of the IFQ program against fraud and abuse is critical to the success of this program and our ability to prevent overfishing. We have requested substantial increases in funding for NMFS enforcement and NOAA General Counsel. Penalties for violations could be severe and include sanctioning of a violator's quota share or registered buyer's permit.

Progress to date

We have made significant progress on all four of these fronts since the IFQ program was approved by the Secretary on January 29, 1993. A Federal Register notice has been prepared which contains the final regulations and responses to summaries of all public comments received on the proposed regulations. Contracted work on developing the initial allocation database was started in April. An interagency IFQ database steering committee was formed to give guidance to this work. Work on systems analysis and computer software began earlier this month through an additional contract with Computer Sciences Corporation. A new division within the Alaska Region to administer the IFQ program has been established and a division chief has been hired. This division currently is staffed with temporary personnel and contract employees but several new positions have been described and likely will be advertised soon.

The IFQ program is one of the largest and most complex fishery management programs undertaken by NMFS, but we are committed to its success and to making the program as "user friendly" as possible. Although I don't have time to explain every detail and facet of the program, I'll be happy to answer your questions either here after this seminar or at the NMFS booth in the Exhibition Hall.

Thank you.

* * *

J. Ginter, 10-17-93, FEXPO.PRE
Revised: 10-19, 10-20, and 10-21-93

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MEMO

TO: Those Interested in Marine Fish Conservation
FROM: Ken Hinman, Executive Director

SUBJECT: Limiting Entry to Marine Fisheries

I am enclosing a copy of THE CROWDED SEA: AN ISSUE PAPER ON LIMITING ENTRY TO MARINE FISHERIES, prepared by the National Coalition for Marine Conservation.

This paper considers the need for limiting entry to marine fisheries, discusses those management problems limited entry might address, and defines and assesses its potential - advantages and disadvantages - as a means for advancing the nation's fishery conservation and management goals.

The National Coalition for Marine Conservation's overriding interest in considering limited entry is resource conservation. This paper neither endorses nor does it reject specific limited entry programs. Instead, we urge a reasoned and deliberate approach in planning the application and implementation of limited entry schemes, suggest some basic principles to guide the use of limited entry as a management tool and enhance its potential for success, and conclude with recommendations for legal and policy changes at the federal level.

It is our sincere hope that this discussion and analysis will contribute to the ongoing dialogue about how limiting entry to marine fisheries can and should fit in to our national fisheries policy.

Thank you for your interest.

Enclosure

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THE CROWDED SEA

AN ISSUE PAPER ON LIMITING ENTRY TO MARINE FISHERIES

by Ken Hinman and Carl Paulsen
National Coalition for Marine Conservation
Savannah, Georgia

November 1993

SUMMARY

Historic open access policies have led to overcrowding and overcapitalization in many U.S. ocean fisheries. This condition contributes to and/or exacerbates overfishing, bycatch, waste, user conflicts, high management costs and economic inefficiency. In response, limited entry as a control on fishing effort is being considered in a growing number of U.S. commercial fisheries. In some cases, this means not merely restricting, but substantially reducing the total number of participants in a given fishery

By virtue of limiting entry into a fishery, the government bestows an exclusive right to harvest a share of a public resource, whether or not individual shares or vessel quotas are assigned. In theory, participants will thus have a greater incentive - a proprietary interest, if you will - to support and comply with measures to conserve fish populations for the long term. These concepts - limited entry and the rights-based fishing it confers - represent a radical departure from prevailing practice.

It is our conclusion that limited entry is not a panacea for fisheries management problems, but rather can help supplement more traditional regulatory measures. Nor are limited entry systems suitable for all fisheries. Whether or not they are a preferred option, and what type of system is appropriate, must be determined on a fishery-by-fishery basis, according to local needs and conditions.

In our view, limited entry, if properly implemented, offers the potential to alleviate a wide range of management problems, including overfishing. Likewise, there are potential pitfalls if all the ramifications of privatizing publicly-owned resources are not fully considered. Above all, any limited entry program should contain, as a principal feature, a demonstrable conservation benefit.

While urging a reasoned and deliberate pace in planning the application and implementation of limited entry schemes, we suggest some basic principles to guide the use of limited entry as a management tool and enhance its potential for success, and conclude with recommendations for legal and policy changes at the federal level.

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This paper was prepared with funding from the David and Lucile Packard Foundation.

I. INTRODUCTION

For the purposes of this paper, limiting entry to marine fisheries means directly restricting the number of fishermen and/or fishing vessels permitted to participate in a particular fishery.

Limited entry is a reversal of the traditional practice of allowing citizens free and open access to publicly-owned fish populations for private exploitation. Limited entry is, by most measures, a fundamental - some would say radical - departure from the *status quo* in the management of living marine resources in the United States.

Putting limits on access to marine fish populations is not new, of course, and can take many forms: for example, fishing within established quotas; restrictions on the use of certain types of fishing gear or the capture of certain species; and time-area closures, where designated coastal waters, such as spawning grounds, are placed off limits during specific periods. These are all forms of controlling public access in order to advance fishery management goals.

Limiting entry may provide an important new tool for conserving and managing some marine fisheries.

What is commonly referred to as limited entry, however, is controlled access in its most severe form; designating a finite number of individuals, or fishing vessels, permitted to operate in a given fishery. And because it is, in many cases, a response to overcrowding, limited entry often means actually *reducing* the number of fishermen* allowed to fish, either directly or through some form of incentives or disincentives.

Limited entry is a heretofore little used and highly controversial management strategy in the U.S. It is still a pariah among many American fishermen, who feel controlling the number of people allowed to fish revokes their traditional rights and inhibits their historic fishing patterns. Even so, an increasing number of fishermen, along with fishery managers and members of the conservation community, recognize that limiting total participation may provide an important new tool for conserving and managing some marine fisheries, a tool that's now missing from the usual bag of regulatory strategies.

Because of mounting interest in limited entry as a legitimate management option - to the point where it is currently being actively promoted in a number of major U.S. fisheries - fishery policy makers, fishermen, conservationists and others would do well to pause and take a critical look at limited entry; in terms of how it might help resolve some of the problems plaguing our ocean fisheries and contribute to the rational use of marine resources for the benefit of all Americans.

In doing so, we should acknowledge upfront that limited entry is not an answer for all the nation's fisheries ills. Indeed, there is a downside, and we must carefully examine it and understand it. In particular, limited entry, by virtue of allocating to certain citizens an exclusive right to fish, raises concerns about the implications and ramifications of awarding private citizens a form of "ownership" of publicly-owned natural resources.

The purpose of this issue paper, prepared for the National Coalition for Marine Conservation with funding from the David and Lucile Packard Foundation, is to consider the need for limiting entry to marine fisheries, discuss those management problems limited entry might address, and define and assess its potential - advantages and disadvantages - as a means for advancing the nation's fishery conservation and management goals.

The National Coalition for Marine Conservation's overriding interest in considering limited entry is conservation, not social or economic engineering. Moreover, this paper neither endorses nor does it reject specific limited entry programs, of which there are a

* Numbers of fishermen will, in most instances, also refer to numbers of fishing units, i.e., vessels, traps, nets, etc.

variety. Rather, it is our sincere hope that the following discussion and analysis will contribute to the ongoing dialogue about how limiting entry to marine fisheries can and should fit in to our national fisheries policy.

II. THE WRITING IS ON THE WALL

Limited entry is an issue fast rising to the top of the national fisheries agenda. It is possible, even likely, that during the next decade the complexion of U.S. fisheries will change dramatically, from policies allowing generally unrestricted participation to some form of direct controls on the absolute numbers of fishermen allowed to fish in many, if not most, of our commercial fisheries.

The handwriting is already on the wall. Where in the past limited entry was discouraged as a management tool, it is now openly and actively encouraged. The National Marine Fisheries Service (NMFS), an agency of the U.S. Commerce Department, advocates "conversion from open access fisheries to controlled access," citing how the "race for the fish" that characterizes open access fisheries causes economic inefficiency, which in turn creates and/or reinforces pressure to overfish (NMFS 1991).

The agency has informed the Regional Fishery Management Councils, responsible for preparing fishery management plans for U.S. marine fisheries under the Magnuson Fishery Conservation and Management Act, that the door is open for approval of limited entry as a major feature of these plans. NMFS even commissioned a national study of individual transferable quotas - ITQs assign certain fishermen the privilege of catching a specified quota - to assist the Councils in considering this management option.

In fact, ITQs, pioneered in New Zealand, Canada and several other countries, are already being used to manage Atlantic surf clams and wreckfish in the U.S. The total number of fishing permits are restricted in fisheries for spiny lobster on the east coast and sea urchins on the west coast. Limited entry plans based on quota-shares, either ITQs or similar individual fishing quota set ups, are under consideration for a number of other fisheries, including but not limited to Pacific halibut and sablefish, red snapper, shrimp, swordfish, grouper, Spanish mackerel and sharks.

Support for limiting entry is coming from outside the federal management system, too. The North American Fisheries Leadership Workshop, a 1991 assemblage of state and federal fisheries administrators from all over the continent sponsored by the American Fisheries Society, recommended exploring and implementing "innovative" access control programs in emerging and existing fisheries (Harville 1991).

In the past, limited entry was discouraged as a management tool. Now it is openly and actively encouraged.

The environmental community, a relative newcomer to marine fisheries issues but one representing the growing interest among the broader, non-user oriented segment of the American public, is also exploring the potential of limited access for achieving conservation goals. The World Wildlife Fund and Center for Marine Conservation, for example, jointly sponsored a two-day conference in September 1992 solely devoted to that topic.

Finally, and perhaps most significantly, a growing number within the commercial fishing industry, long a mighty fortress of opposition to the notion of government deciding who can and cannot fish, are now giving limited entry a fresh look. The growing perception within the industry is that allowing free and open access is failing both the fish resources and the fisheries they support, as evidenced by sharply declining catches in several of the country's most valuable fisheries, declines that are occurring in spite of - or maybe we should say because of - an unprecedented rise in fishing effort.

"You can't conserve stocks in a free-for-all," concludes Richard Allen, a commercial

fisherman and member of the New England Fishery Management Council who was himself once a staunch foe of limited entry. That sentiment is being echoed across the country.

III. WHAT'S WRONG WITH THIS PICTURE?

Prior to 1976, waters off the U.S. coastline were truly open access, open to foreign as well as domestic fishermen. But over-exploitation by visiting foreign fleets triggered a shift in policy, restricting foreign fishing near our shores. In 1976, the U.S. Congress enacted the Magnuson Act to "promote [domestic] commercial and recreational fishing" within a 200-mile fishery conservation zone "under sound conservation and management principles."

In the years following passage of the new law, the U.S. fishing fleet grew substantially, by 40% in numbers of boats and 60% in numbers of fishermen. At first this expansion, replacing displaced foreign vessels within our zone and exploiting under-utilized species, produced a substantial rise in domestic fish catches. But beginning in the 1980s, the correlation between increased fishing effort and higher catches broke down. Although effort continued to rise - both in terms of the numbers of active vessels and the fishing capacity per vessel, thanks to the development and use of more sophisticated gear and fish-finding technologies - catches peaked and, in most major fisheries, fell into a decline.

Fishermen are expending an increasing amount of effort to catch a decreasing amount of fish.

Today, 67 species or stocks of fish found off the U.S. coastline are overutilized, many severely, according to the most recent government studies. That amounts to 43% of those stocks whose condition is known. Overall, our marine fisheries are overfished and under-producing. The long-term potential yield of U.S. fisheries is estimated to be 7.7 million tons a year, about 50% higher than recent average yields (NMFS 1992).

NMFS estimates that overfishing and over-capitalization - that is, more fishing capacity than is needed to catch the available, or surplus, fish - are depriving the U.S. commercial fishing industry of approximately $3 billion a year in economic benefits. The economic impact of lost recreational opportunities is unquantified but thought to be equally substantial. Less well known, but potentially more damaging from both a biological and economic perspective, are the long-term effects of overfishing and stock depletion on the stability of ocean ecosystems.

Generally speaking, the amount of fishing effort being expended in U.S. fisheries far exceeds the amount needed to catch what the resources are capable of producing on a continuing basis. In other words, an increasing amount of fishing effort is being exerted to land a decreasing amount of fish.

One of the most dramatic examples is that of New England groundfish, among the nation's oldest and most valued fisheries. Unchecked expansion of the U.S. trawl fleet beginning shortly after passage of the Magnuson Act eventually drove cod, haddock and flounder populations down to all-time lows. Today, with too many fishermen chasing too few fish, the industry is in dire financial straits.

The cost to the nation in lost economic benefits is staggering. If the groundfish stocks were restored and fishing effort brought into balance with the capacity of the resource to sustain it, the fishery could produce $350 million more in gross income annually and 14,000 additional jobs (Sissenwine and Rosenberg 1993). If this isn't done, warns Richard Roe, northeast director of NMFS, "the New England groundfishery, like the New England textile industry, may become history" (Roe 1993).

Or consider also the southern shrimp trawl fishery, another of the nation's most valuable.

The number of boats and amount of effort in the Gulf of Mexico shrimp fishery tripled between 1960 and the late 1980s, to where today there are an estimated 15,000 active trawlers. Yet during this period of growth, catches decreased by 300 pounds per vessel ton. In the south Atlantic region, shrimping effort has also risen dramatically. Around 1930, there were fewer than 650 boats catching 30 million pounds of shrimp. By 1989, the number of fishing permits had increased to 5,300, yet catches remained at or below 30 million pounds (SAFMC 1993).

The Atlantic harpoon fishery, to cite yet another example, caught 7.2 million pounds of swordfish in 1959. That total is more than the recent (1992) U.S. catch. In other words, fishermen using harpoons landed more fish than today's modern longline fleet of well over a hundred vessels employing 30-mile sets with more than 500 hooks per set. What's more, the harpooners' average size fish was over 200 pounds in 1959, compared with about 60 pounds today. They operated in a relatively small area for several months, while the longliners work year-round, from the Flemish Cap in the North Atlantic to the waters off Brazil.

The story - increasing effort and declining catches - is the same worldwide. According to the United Nations Food and Agriculture Organization, declining landings are being taken at a much higher cost to the world's fishermen. The annual operating cost of global fishing in 1989 was about $22 billion greater than revenues (FAO 1992). The red ink is, in most instances, offset by government subsidies.

IV. THE TRAGEDY OF THE OCEANS

There are numerous examples of uncontrolled growth in fishing fleets until the catching capacity far exceeds the sustainable yield," confirm NMFS senior scientist Michael Sissenwine and Andrew Rosenberg, scientific editor of the agency's annual status report on U.S. fisheries. "A fleet will continue to grow until there is no longer an economic incentive for other vessels to join it. At this point, proposals to reduce catch (to conserve the fishery resource) are met with strong opposition, because most vessel owners cannot survive even a short-term catch reduction" (Sissenwine and Rosenberg 1993).

This cycle of open access leading to overcapacity leading to overfishing, repeated again and again in fishery after fishery, precisely describes the well-known "tragedy of the commons," popularized by Garret Hardin in his famous 1968 essayof the same name.

The tragedy is that, in the unfettered use of the ocean and other common property resources, what is in the best interests of the individual is not necessarily in the best interest of the resource or of the community as a whole. Individual fishermen, even when confronted with an overall decline in fish populations, have no short-term incentive to conserve - that is, voluntarily constrain their own fishing effort. Each fisherman believes, and with good reason, that what he or she doesn't catch, someone else probably will. Hence, open access fisheries often deteriorate into a race for the fish, or what is often characterized as derby fishing.

In the frantic race for fish, conservation takes a backseat to immediate financial concerns.

The commons problem was actually first applied to fisheries in a 1954 article by Scott Gordon. Gordon argued that "(c)ommon property resources are free goods to individuals and scarce goods to society." Under freedom of access, he warned, unregulated fishing effort increases until fishing becomes unprofitable and resources are overexploited (Gordon 1954).

In most developed fisheries there is some regulation of fishing activities - quotas by species, size limits, gear restrictions, seasonal closures and so forth. But in very few fisheries are there any direct controls on the number of participants or the total amount of fishing

capacity permitted. Without such controls, managers must devise rules to limit fishing effort by making fishermen less efficient. So instead of an appropriate number of fishing vessels working at full capacity, there are an excessive number of boats regulated in a way that ensures they operate inefficiently.

The most drastic example of an overcrowded, open access fishery is North Pacific halibut. With on average 4,000 vessels competing for the annual quota, the fishery consists of just two 24-hour "seasons" during which fishing resembles a feeding frenzy. According to biologists, the fleet is twenty times bigger than is needed to catch the available resource. This Alaskan free-for-all is not only grossly inefficient, but results in an enormous amount of waste, as damaged fishing nets and lower value fish are tossed away at sea in the frantic race to catch as many fish as possible in the limited time allowed (NPFMC 1992). Tragically, the lives of seven fishermen were lost last year in the halibut free-for-all.

Open access does not in and of itself cause overfishing. But it does create pressures to overfish that traditional management methods have failed to control.

Overcapitalized and overexploited fisheries operate at an economic loss, with each fisherman getting a smaller piece of a shrinking pie. Conservation and other concerns take a backseat to immediate financial ones, such as paying boat mortgages and other bills. With few alternatives, marginal fishermen keep fishing, trying to increase or at least maintain catches, with little regard for the long-term impact on the resource or the long-term viability of the fishery it supports.

Managing fisheries for their long-term sustainability requires a careful balance between catches now and maintaining healthy and productive resources for the future. A free and open fishery, however, offers few incentives for individual restraint and puts the emphasis squarely on maximizing present catch. In turn, the pressure on competing fishermen to land as many fish as possible, as quickly as possible, is translated into pressure from the fishing industry on managers to keep total allowable catch levels as high as possible in order to accommodate the excess of users.

V. OPEN ACCESS AND OVERFISHING

From a strictly resource conservation perspective, the real problem is not that there are too many fishermen *per se*, but that they are catching too many fish. Open access does not, in and of itself, cause overfishing. It does, however, create pressures to overfish, in ways that traditional management has difficulty controlling.

Fishermen have a narrow range of incentives within which to act, most of them financial. When fishing is profitable, fishermen invest in gear and technology to give them greater catch capacity. Others enter the fishery, adding even more fishing power. Inevitably, catches will at some point cease to increase incrementally with the addition of fishing effort, then do not increase at all, and finally start to decline.

If prices rise as the fish become scarce, as often happens, this pattern will continue, with perhaps even more fishermen joining the fishery to take advantage of the high prices. If prices do not increase to offset declining landings, fishermen will strive to increase their catch by intensifying their fishing effort or seeking to remove restrictive regulations.

Ironically, the nature of open access fisheries - touted by some as a pure manifestation of free market competition - is such that free market incentives do not cause individual fishermen to voluntarily depart from a fishery when they determine their individual catch is not worth the economic and social costs they accrue and that greater return might be obtained elsewhere (as would happen in most other sectors of the economy). Most fishermen fish because there

When a fishery is overcrowded with too many participants, the pressures to keep catches high can be insurmountable.

is nothing else they'd rather do. They will remain in the fishery, or if not, move to another one.

As fish populations are depleted by overfishing, measures to rebuild the fishery will be proposed. Such measures invariably will impose increased costs to fishermen in the short-term. Fishermen will resist regulations designed to prevent overfishing or rebuild a depleted stock in whatever ways they can.

In New England, for example, groundfish fishermen have successfully fought direct catch limits despite years of overfishing which has led to the fishery's collapse. They have agreed to indirect controls on catches - ones that are readily ignored or evaded - but the fishermen have routinely rejected all meaningful attempts to reduce fishing effort. Similarly, the southern shrimp fishery has become increasingly marginal and at the same time increasingly vocal against measures to control the bycatch of sea turtles and finfish. The industry has so far successfully fought off regulation of finfish bycatch, despite its devastating impact on other fisheries, most notably red snapper.

From a conservation standpoint, resistance to regulation is probably the most crucial consideration in the open access vs. limited entry debate. Under our present management system, decision makers are under constant pressure to prove that proposed regulations will benefit all those currently fishing. This is difficult because "the costs and benefits of conservation measures are not coincident" (Wilson and Gates 1976). Fishermen frequently oppose conservation measures simply because they cannot be ensured of receiving the benefits of their sacrifice.

By definition, conservation equals addition by subtraction, that is, fishermen must give up something today in order to get back something tomorrow. But as long as fishermen view conservation as a short-term economic loss with no guarantee they will personally reap a future benefit, they will try and circumvent existing conservation measures and resist the implementation of new ones.

There are numerous examples of catch levels being set too high precisely because managers are under pressure from fishermen to allow them to maximize their catch for short-term economic reasons. When a fishery is overcrowded with too many participants, each just scratching out a living, the pressures to keep catches high can be insurmountable.

When the number of participants so drastically exceeds what's needed to catch the sustainable yield, the fishery gets out of hand and managers lose their ability to control fishing mortality, even when a fishery is managed under a quota, or total allowable catch limit. As already pointed out, competition within an overcrowded fishery degenerates into a fishing derby. In this free-for-all environment, such concerns as bycatch of non-target or prohibited species, discard of low value catches (known as "high-grading") and waste are secondary at best. At worst, they are of no concern at all.

In the race for fish, there is little regard for bycatch, discards or waste.

Under conventional (open access) management schemes, competition for a scarce resource can be intense. In this atmosphere, worrying about bycatch, discards and waste costs fishermen time and time is money. In short, the race for fish eliminates the luxury of a conservation ethic.

In addition, the hectic race to catch fish before the fishery is shut down enhances the likelihood the quota will be exceeded. If a fishery is too diffuse, there will be unreported catches and frequent quota over-runs.

Extrapolations of catch data from small at-sea or dockside samples are inaccurate, and self-reporting systems are unreliable. Closures, therefore, are initiated based on rough estimates of the total catch at a given point in time.

Without direct limits on fishing capacity, some attempts to reduce fishing effort can actually result in increased mortality. For example, if managers reduce the length of a fishing season, fishermen will fish harder while allowed, setting more hooks or traps or laying larger nets. In such cases, observes Lee Anderson, economist and member of the Mid-Atlantic Fishery Management Council, management becomes a game played between managers and fishermen, where fishermen always have the last move. If there is a legal way to circumvent the intent of the regulations, they will find it.

Regulating fishermen without limiting entry can prevent overfishing - in theory, if rarely in practice. Gear and area restrictions, days-at-sea limits and other traditional management tools aimed at controlling access to fish populations all have the potential to stop overfishing and rebuild depleted stocks. Unfortunately, managers operate under political constraints; they often lack the political fortitude necessary to establish a biologically sound program and ensure its enforcement.

Nonetheless, in fisheries where existing regulations have successfully prevented overfishing, markets and the industry can be left to determine the appropriate fleet size. Individuals can keep fishing as long as the profits and wages are acceptable, without managers establishing the level of fishing effort. In these cases, there is no need for limited entry. Should these controls begin to fail, however, limited entry may need to be considered.

VI. THE POTENTIAL BENEFITS OF CROWD CONTROL

It is axiomatic among military experts that we fight each war with the weapons of the next war and the strategies of the last. In a similar way, fishermen and fishing technology outpace the ability of managers to control them through traditional regulatory strategies.

Without controlling the size of the fishing armada that occupies the seas off our shores, we've had little choice but to disarm the fishermen; that is, regulate their activities in such a way as to make each fisherman as inefficient as possible. The logical endpoint of this indirect approach would be allotting fishermen one hook and line or harpoon or cast net apiece.

Let's be clear. Limiting the number of fishermen or fishing vessels alone will not reduce fishing mortality. But it can make it easier for managers to design and implement regulations that will. Limited entry is just one more tool among many for managing fisheries. Limited entry is not meant to, nor should it, supplant other controls. What it can and should do is supplement them.

The goal of fishery management is to bring fishing effort and fishing mortality into line with what the resource can sustain on a continuing basis. There are three basic methods of achieving this balance: 1) limiting the quantity of fish landed (quotas, size limits); 2) limiting the efficiency of fishing practices (gear regulations, trip limits); and 3) limiting the total fishing capacity (limited entry). With few exceptions, managers have heretofore dealt almost exclusively with the first two of these options. In expanding and overcrowded fisheries, effective management must address all three.

To make sacrifices, fishermen want to feel confident they will have a fair chance of reaping the benefits.

With resource conservation as our primary objective, there are a number of potential benefits to be realized by limiting entry to marine fisheries. (The potential problems with limited entry are discussed in the next section.)

- An Incentive to Conserve

Without some form of exclusive use rights (license limitations, quota shares, etc.), fishermen tend to view conservation as a trade-off between present and future catches. By giving fishermen a long-term stake in a fishery, limited entry can alter their attitude toward conservation, and provide them with both an economic and a moral incentive to conserve (Fullilove 1993).

Ideally the right to fish should be based on a pact between fishermen and managers, an agreement to fish in certain ways and to accept certain restrictions as necessary to achieve conservation goals, in return for the privilege of exploiting a public resource for private gain.

Vesting fishermen with a tangible share of the resource provides them with a measure of insurance that they will reap the benefits of their own sacrifice, in the form of reduced catches now in return for increased catches from a healthier stock later on. An analogous situation might be the farmer's recognition that soil conservation is in his or her own (long-term) best interest.

In addition, if those active in a fishery are more stable economically, and there is an incentive to conserve based on anticipated returns, then we should expect less political pressure to subvert conservation goals than exists under an open access system. Fishermen will be more willing to ride out leaner times if they feel they will be the recipients of stock restoration efforts. Fishermen may support conservation measures as beneficial to them if they realize that their sacrifice will not be undone by an increase in effort by their competitors.

(The ability of limited entry to offer a conservation incentive will depend to a large extent on whether future gains can be assured. As such, fishermen will need to feel reasonably certain that they will retain exclusive privileges in the uncertain future. See related discussions in Section VII, Caveats and Potential Problems, and Appendix 2, Private Property at Sea.)

- More Efficient Management

Although achieving economic efficiency motivates many proponents of limited entry, management efficiency - i.e., the effective maintainance of healthy fish populations for the benefit of the nation at minimal cost to the taxpayer - is in the greater public interest.

Limiting numbers of fishermen in overcrowded fisheries can create a more manageable group of fishermen. Generally, limited entry can reduce the margin of error in fisheries management by more finely tuning the capacity of the fishing fleet to the amount of harvestable resource. Management may become less manpower-intensive as monitoring catch and effort becomes easier, as does law enforcement. (See related discussion in Section VII.)

With a defined set of fishermen and a defined catch, managers can rely more on dockside vs. at-sea enforcement of conservation measures. Indirect controls on fishing effort, such as minimum mesh sizes in trawl nets, must be enforced on the water. But at-sea regulations are notoriously difficult and expensive to enforce.

With exclusive use rights, fishermen have, in addition to an incentive to conserve, an incentive to obey the rules and report those who don't. To the extent that some measure of self-policing occurs, it would enhance at-sea enforcement of restrictions on bycatch and discards, illegal transfer of catches to other vessels, and so on.

- Minimize Bycatch

In some fisheries with bycatch problems (the inadvertent capture of non-target or prohibited species) the handling of the bycatch can make the difference between a fish returned to the water alive or discarded dead. In this case, dead discards are a product of carelessness and haste. To the extent that limited entry fisheries minimize, and in some cases remove, the need to race for the fish, bycatch mortality will be reduced. (See also bycatch discussion in Section VII.)

High mortality of bycatch species is a serious resource problem in many fisheries, but it is also an economic problem. More selective

methods of fishing may not be economic, or perceived by fishermen to be economic, in the short run. But with the pressure of free-for-all competition removed, that is, if fishermen are assured of having an opportunity to land their portion of the total catch at their own pace, then they should be more amenable to accepting regulations designed to reduce bycatch, or to experiment with innovative gear technologies.

In some fisheries, most notably the southern shrimp trawl fleet, the level of bycatch appears to correspond directly with effort. The shrimp population yields a fairly static amount of catch each year, and when effort is increased, it is not matched by a proportionate increase in landings. Bycatch of finfish, on the other hand, which may outnumber the shrimp catch by ten-to-one, does increase linearly with effort.

The size of the Gulf of Mexico shrimp fleet increased from 5,000 vessels in 1950 to an estimated 15,000 vessels today, with only a slight rise in landings. Because of overcrowding, trawlers regularly drag their small mesh nets in areas less productive in shrimp but equally or more productive in bycatch species. Thus, incremental increases in effort have had a disproportionate impact on bycatch species.

A substantial cutback in fishing effort would have little impact on total harvest. A fleet approximately one-third the current size could harvest the same amount of shrimp (GMFMC 1991). Such a fleet reduction could result in significant bycatch reductions by getting thousands of unnecessary nets out of the water.

Both collecting information on bycatch and crafting measures to reduce it requires a fairly comprehensive onboard observer program. Limited entry can make those programs easier to implement and less costly to administer. It might also facilitate incentive/disincentive programs aimed at promoting the use of selective gear.

- Protect Habitat

The race to fish may also cause environmental degradation, by fishermen leaving lost nets in the water rather than bothering to retrieve them. Again, fishermen feel they can't always take the time to collect gear if it gets snagged and breaks away or has to be cut loose. Even more importantly, though, limited entry could help make fishermen stronger and more active advocates for environmental protection. To the extent it confers an exclusive right to a share of a resource, defuses conflicts with other users, and yields greater financial stability, fishermen will be better able and more willing to direct their energies toward wetlands protection and pollution abatement in order to protect their long-term interests.

VII. CAVEATS AND POTENTIAL PROBLEMS

It is also axiomatic that if something can go wrong, it probably will. No one answer is perfect, no one management system will solve all problems. There are no absolutes in fisheries management - "always" means "sometimes," "never" means "rarely," "will" means "may." Problems exist from the outset, others arise as time passes.

Limited entry is no different. As with all management systems, certain problems will be more pronounced in some fisheries than in others, thereby reinforcing the need to consider each fishery on a case-by-case basis and match the type of management program to individual circumstances. Clearly, there will be cases where limited entry is not appropriate, others where it may be the only realistic solution.

The greatest concern is the effect of making fish the private property of fishermen.

Having said that, there are some key concerns to be examined whenever limited entry is considered as a management option.

- Property Rights

Perhaps the greatest concern and greatest unknown is the effect of vesting fishermen with property rights. Limited entry programs that

do not carefully define property rights may create a situation in which the government's ability to regulate fishing is actually curtailed.

Throughout a wide range of environmental issues, groups representing industry are raising the issue of private property rights as a means to fight regulation. Advocates of a broad interpretation of property rights contend that the government is limited in how far it can regulate the use of private property without compensating the owner for lost opportunities. Restrictive regulations are seen as a "takings," in effect taking away one's property rights.

In fact, many government regulations do restrict the use of property, but few actually "take" property away from the owner. The Supreme Court recently suggested (in Lucas v. South Carolina Coastal Council) that regulation would have to result in the complete loss of the use of the property in question for it to result in a takings. When even a small economic use of the property remains, regulations protecting the public interest may be justified without compensation. Nonetheless, while the jury is still out on exactly whether and when regulations qualify as a takings, the property rights argument has been an effective inhibitor to some environmental regulation.

Effort displaced by limited entry may increase pressure on other resources.

It is unclear just how the takings principle would be applied to fishing rights under limited entry. When the property in question is a *share* of a fishery, a right to harvest a portion of the available fish, the right granted is not over a physical object. Still, fishermen might argue that regulations that reduce their catch (if not their share) deprive them of a reasonable return on their investment.

How fishing rights are viewed in this context will depend [in part] on just how the rights are established. This problem is potentially serious and limited entry programs that establish rights must be carefully crafted to avoid it. At a minimum, the public must retain ultimate authority over how the resource is used. (See Appendix 2, Private Property at Sea, for a further discussion of privatization of fishery resources.)

- Decreased Mobility

Fishermen have always relied on being able to shift from one fishery to another depending on the availability of fish, weather conditions, and a host of other factors. This mobility can to some degree help alleviate fishing pressure on stressed stocks by allowing fishermen alternative targets. By tuning harvests to meet demand and respond to stock fluctuations, fishermen also improve their efficiency.

All forms of limited entry will by definition restrict mobility. The consequences of restricting mobility must be considered and balanced against the benefits of the limited entry program. It may be appropriate to develop and incorporate some mechanism to allow mobility among fisheries under limited entry. Short term transfers of shares, such as leasing, might allow some inter-fishery movement. Such programs, however, will likely increase the burden on enforcement, and may create more problems than they solve.

- Displaced Effort

The effort reduction gained by limiting entry may end up displaced into fisheries without limited entry restrictions. Many of those who choose fishing are wedded to a livelihood on the sea, and are therefore not likely to leave fishing altogether if there is another fishery to enter. Assuming that not all fisheries will limit entry, there will always be a place to go, and the displaced effort will only increase pressure on those other resources. This may in turn compel those fisheries to consider limiting entry, even if it would otherwise be entirely inappropriate.

- Waste

Some critics of limited entry believe high-grading - the discarding of low value fish in favor of higher value fish - would be encouraged by some quota share systems. For instance,

if a vessel has a limited amount of fish to harvest based on its share of the total allowable catch, and if it is guaranteed the right to catch that quantity during the course of the trip or season, there will be an incentive to keep only the most valuable fish to be counted against the quota. High-grading would be most problematic in fisheries where there is a significant price differential (whether size, sex or species related) among the fish in the catch.

Mixed species fisheries pose a special problem in terms of high-grading. If a quota is allocated in terms of allowable catch for each species, either the species whose quota is already reached must be discarded as fishing continues for other species, or fishing must cease as soon as the first species quota is met.

High-grading already occurs in open access fisheries. The extent to which it will undermine conservation objectives under limited entry by increasing discard mortality will depend largely on how effective a quota-share system is in instilling the conservation ethic among fishermen. If they recognize they have a tangible stake in the health of the resource, if they police their own fishery and report violators, if they adopt more selective fishing practices, etc., then high-grading may become less of a problem, not more. In any case, limited entry programs should outlaw high-grading and enforce against it to the greatest extent possible.

- Bycatch

While limited entry programs could facilitate efforts to control bycatch (see Section VI), they may also create new problems. When there is limited entry in one fishery and the same species is taken as bycatch in another, that bycatch undermines the exclusive nature of the limited entry right. If allowed to be landed, the bycatch allowance will cut into the quotas shared by those in directed fishery. If not, it will merely be discarded. The result is either unhappy share owners in the first instance or waste in the second.

Bycatch problems must be addressed whether or not limited entry is initiated, through fees and incentive programs, regulation of gear and fishing practices. But limited entry makes it all the more critical to resolve them. Where the bycatch problems are insurmountable, those fisheries may not be suitable for limited entry.

- Enforcement Costs

Enforcement is critical for limited entry, as it is with any management program. But research, data collection and monitoring, which are essential to the successful implementation and enforcement of limited entry, are costly. The highest costs will come at the beginning, in designing and implementing a limited entry system. But in the long run, administrative costs, including enforcement and data collection, may decrease (see Section VI). If fees are assessed on the permitted fishermen, this could offset any increased costs incurred as the result of implementing a limited entry system.

Under current law, managers cannot recover the costs of management from fishermen.

VIII. PAYING THE RENT

While the notion of free and open access in fisheries is somewhat misleading (there are costs associated with running a fishing operation), fishermen are not required to pay a fee to harvest fish. Land-based extractive industries, on the other hand, are charged fees for the use of the public's natural resources, although usually not at market rates. Even private landowners are assessed a form of "user fee" through property taxes. Why should fishermen be treated any differently?

The question becomes even more important under limited entry systems that ensure an individual an exclusive right to harvest a resource. That right must come with a set of responsibilities. It's in the public interest to maintain healthy renewable resources even when it is also interested in putting those resources to use. The costs of management should be the responsibility of those who benefit

from the use of the resource.

Programs that establish fishing rights free of charge provide an unfair advantage to the few who receive them. Marketable rights, such as individual transferable quotas, develop value as soon as they are granted. Since they are inherently exclusive, anyone wishing to enter a fishery after fishing rights are established will have to buy into that fishery at market value.

The new fishing rights create wealth that did not previously exist and confer it upon anyone fortunate enough to qualify for them. The government should not be in the business of bestowing windfall profits on individuals from the sale of public property. If marketable rights are to be established, the initial allocation should collect a fee in some market-oriented fashion.

Auctions have been proposed as a means to distribute the initial shares of fishing rights in a manner approximating the market. But an open auction might eliminate some of the historic participants in the fishery from consideration because of the potentially high upfront costs. On the other hand, while it could be argued that historic participants deserve a right of first refusal by dint of helping develop the fishery, restricting sales may make it difficult to get fair market value. Whatever the method used, provisions must be made at the outset for a means to attach a price to marketable rights.

Revenues generated through user fees and permit, license or lease systems attached to privatization should be used to fund a number of critical management-related needs. Among these are: fishery research and data collection, habitat protection, bycatch reduction and enforcement. In addition, a portion of the funds might be used to help minimize the impacts to those pushed out of the fishery or otherwise impacted by limited entry. Such assistance would make limited entry more acceptable to the industry.

Unfortunately, under current law, federal managers cannot recover the costs of management from fishermen. They can only recover costs of administering a license or permit system, and even then that money ends up in the general treasury rather than going to fisheries administration. In order for the public to collect rent on the use of its marine resources, the Magnuson Act will have to be changed to allow the government to charge user fees above permit administration costs. The law should also stipulate that the new revenues be deposited in a dedicated fisheries trust fund, and that these funds supplement, not replace, existing monies.

IX. MANAGEMENT PRINCIPLES FOR LIMITING ENTRY

Limited entry is not a final answer, it is an experiment. But that experiment is much more apt to succeed if certain basic principles are applied. Limited entry programs should:

→ **contain a clearly defined conservation objective.** Fisheries management must first and foremost prevent overfishing, according to National Standard No.1 of the Magnuson Act. Furthermore, according to National Standard No. 4, Fishery Management Plans cannot have economic allocation as their sole purpose. Economic allocation and efficiency must be secondary to the goal of improved conservation. Economics can and should contribute to the discussion, especially in determining the type of limited entry system appropriate for a particular fishery, but these considerations should not be the prime motivating force behind limited entry management.

The limited entry program should spell out the conservation problems it is designed to resolve, outline how the program will resolve them, and how it will monitor progress toward achieving its goals.

→ **start with a solid information base.** A thorough understanding of the fishery is essential to deciding if limited entry is appropriate and designing a suitable program. Before any limited entry program is implemented, there must be an established data collection system, preferably with a lengthy time series of information on the fishery, including socio-

economic as well as biological data. This information is essential for determining who and how many are eligible to participate and on what basis, how much of a share each participant gets, what the capacity of the fishery is, and a host of other issues.

➔ **provide for open public involvement in all management decisions.** The public, not the users, must make final fishery management decisions, with those decisions based on sound biological principles, as the Magnuson Act mandates. Current public decision making procedures, such as the open forum provided by the Regional Fishery Management Councils, are essential to ensuring that the public has a voice in those decisions.

➔ **carefully define property rights.** Fishing rights should be carefully established, whether under a license limitation or individual quota system, in such a way as to give fishermen a conservation incentive, i.e., they must be reasonably assured of reaping the benefits of their sacrifices. Such rights should be exclusive but not absolute. Managers must be able to restrict fishing operations, including reducing catches as under non-limited entry fisheries, without invoking a takings claim. In short, the public must retain ultimate management authority.

Whether limiting the numbers of vessels or assigning quota shares, a fair and reasonable method for assigning rights must be devised. The program should recognize historic participation in the fishery, and may also account for historic catches. (Appendix 2 contains a further discussion of special requirements and considerations which should apply to limited entry programs that establish property rights.)

➔ **feature adequate provisions for enforcement.** Switching to limited entry systems will require a change in the way we enforce regulations. The change will require new and innovative enforcement strategies and technologies. In some cases, a careful paper trail to monitor catches and electronic vessel tracking systems will be needed. Penalties will have to be sufficiently severe (for instance, the loss of fishing privileges) to deter non-compliance. Without these changes, enforcement will be inadequate to protect the resources and the interests of those in the fisheries.

➔ **contain complementary regulatory measures.** Entry limitation alone cannot control fishing effort and mortality. Above all else, managers must establish a biologically sound total allowable catch level, or there will be no conservation benefit. Other restrictions, such as gear-based measures, will also be needed in order to control bycatch or reduce fishing mortality on specific age groups.

➔ **reduce participation in overcrowded fisheries.** When dealing with an overfished or depleted resource, limited entry, as part of a rebuilding program, should allow for a decrease in the total number of participants, not merely lock in the *status quo*. At the same time, managers should work with industry and coastal communities to anticipate and minimize social and economic disruptions.

➔ **be flexible and open to change.** Limited entry programs must be readily modifiable to meet changing conditions and circumstances. We learn from our mistakes and managers must retain the freedom to adjust the rules accordingly. Such adjustments might even include increasing participation in the future if the fishery is able to sustain it, or opting for an entirely different management approach should the existing program fail to achieve its goals.

➔ **assign quota-shares as a percent of the fishery.** In fisheries where quota shares are established, these shares should be assigned as a percentage of the total allowable catch of fish, not as a quantity of fish. This allows each individual shareholder's catch to increase or decrease according to the condition of the fishery.

➔ **contain protections against concentration of shares.** Individuals and vessels should be limited in the amount of shares they can accumulate. Without some kind of limitation, shares will likely concentrate in the hands of a few, reducing the level of employment in the

fishery and making it difficult for others to enter. As fishing rights concentrate, those with rights gain increased influence over managers and markets. There should be a limit on the percent of the total allowable catch that any one shareholder may accumulate.

In addition, consideration must be given to the entity to which the shares are attached, i.e., the captain, the vessel, a corporate body or some other entity. Corporations may be able to hide the accumulation of shares under elaborate corporate structures, while vessel-based shares allow an individual to amass shares by acquiring vessels. On the other hand, shares tied to captains may not limit the number of vessels and fishing power deployed, which can lead to bycatch and other conservation problems.

→ **allow for non-use of quota shares.** There should be no penalty for not utilizing a quota share. Non-consumptive use must remain an option, even for a commercial shareholder.

→ **be coordinated with fisheries development activities.** We can't have one arm of government promoting fisheries development while the other tries to control overcapitalized fisheries. The government currently has several programs promoting private development, including fisheries development grants, marketing research and export assistance, low interest and/or government-guaranteed loans for vessel construction, training programs, and gear development. These programs encourage entry and increased capacity by directly subsidizing it or reducing financial risk. Fisheries aid programs will conflict with the goals of limited entry, and should be reviewed and adapted to fit these goals.

→ **consider provisions to assist displaced fishermen.** Any significant reduction in fishing effort will create winners and losers. Limited entry plans should distribute the benefits in a fair and reasonable manner. Managers could devise a plan for treating those displaced by a reduced entry system, through a buy-out or some other form of compensation, or job training. Funding to aid displaced fishermen should come from the initial sale of fishing rights and/or user fees.

X. RECOMMENDATIONS

Recognizing the benefits of limiting entry to marine fisheries while acknowledging the legitimate concerns raised by its critics, the authors recommend moving ahead at a slow and deliberate pace in order to enhance its potential for success.

1. **Develop A National Policy.** The Clinton Administration should adopt a National Fisheries Policy addressing the issue of limited entry and privatization of marine resources, to guide implementation of limited entry programs in a thoughtful and careful manner. Among other things, that policy should define property rights such that certain management changes or use restrictions cannot be construed as a "takings." The ultimate rights of ownership of the resource must be retained by the public.

2. **Declare a Moratorium.** Congress and/or the Department of Commerce should impose a temporary moratorium on the implementation of limited entry programs that privatize public resources by conferring property rights until the Administration develops a national policy and appropriate amendments (see below) are added to the Magnuson Act.

3. **Establish A Fee System.** Congress should amend the Magnuson Act to allow the federal government to charge economic rent to pay for fisheries research, data collection, management and enforcement programs. All funds collected under the fee system should be deposited in a dedicated trust fund for marine fisheries enhancement.

4. **End Industry Subsidies.** Government subsidies to fisheries development which contribute to overcapitalization should be eliminated as they conflict with the conservation goals of limited entry programs.

5. **Reduce Conflict of Interest in Management Decisions.** The Magnuson Act should be amended to proscribe citizens who

have a vested economic interest in a fishery from serving as a voting member of the Fishery Management Council regulating that fishery.

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Appendix 1

THE LAST FRONTIER

Open access to marine fisheries is a vestige of the enduring presumption, only recently challenged, that the sea belongs to everyone and no one, that nothing humans do will harm it, and that fishing, whether for food or recreation, is a god-given right.

Marine fish are, in fact, the last common property living resource in the United States to which access is free and open. Although fishing is a consumptive use of a renewable yet finite public resource, it is not treated like other such resources; national forests and federal range lands, for instance. Access to these other national resources is strictly controlled and fees are levied by the government for the privilege.

Fish, unlike most terrestrial wildlife, inhabit "property" that can't be fenced in, and thus are not subject to traditional or accepted modes of establishing property "rights." Of course, with the advent of coastal nations claiming sovereignty over 200-mile zones, wherein domestic fishermen may obtain sole access to coastal fisheries, fences are going up at sea all the same. Even so, ownership of the sea and its resources, unlike ownership of property on land, does not yet extend vertically below established governments to the individual.

Or does it? The fisherman's claim to a free and unlimited right of access to ocean fish stocks is actually a remnant of an archaic system whereby the simple act of using a common property resource - in this case catching fish - establishes the right to that use. Indeed, although we may consider fish common property, they become the private property of the fisherman the moment they are caught. Allowing open access fishing might be described as a "takings" in reverse; private individuals "take" property that belongs to the public without compensation.

Common attitudes toward fish contrast with the way we manage wild animals on land. For one thing, commercial fishing at sea is the last large-scale food producing system based on the hunting process. Hunting on land does not offer corollaries, since market hunting (with few exceptions) is outlawed in the U.S. Migratory animals that respect artificial fences no more than fish do, such as waterfowl, are not subject to market hunting, but are instead reserved for sporting purposes.

By definition, sport hunting (including sport fishing) is an inefficient method of killing. Indeed, its inherent inefficiency may be the more pertinent factor in the relative success and sustainability of so-called "game management" than the fact that it is not a commercial enterprise. Commercial hunting was banned, in large part, because modern man developed the capacity, unchecked by any sporting ethic and motivated by profit, to wipe out entire species of wildlife.

Still, it has only been fairly recent in our history - the last 35 years or so - that fishing technology has advanced to the point where fish populations can be decimated, even driven to commercial, if not biological, extinction. The once popular misconception that the ocean holds an inexhaustible supply of fish is finally giving way to the truth. Attitudes and values are beginning to change, due in part to the mass migration of the populace into the coastal zone, where life is more, if you will, ocean-aware. This growing awareness is reflected in the mainstream environmental movement's recent entry into the marine fisheries arena.

Another characteristic of marine fisheries that has probably retarded public concern for fish conservation is that fish are out of sight, out of mind. It is more difficult to measure fish populations and assess cause and effect in the ocean environment than it is in a terrestrial regime. Counting fish is not like counting deer. The risks of overfishing are not as easy to predict. The unknowns and the uncertainties are more pronounced, which can lead to a lack of concern and which can be, and often is, used as an excuse for doing nothing.

There are cultural attitudes, too, that perpetuate open access policies. If in the public

mind there is a growing recognition that there are too many fishermen now going after a shrinking supply of fish, there is also a counter-perception that fishermen have a right to remain fishermen as long as they choose that way of life. Actually, it's more than that. Society benefits from preserving the fisherman's traditional way of life, the thinking goes, a valuation akin to that of preserving the small family farm.

Preserving traditional ways of life is an important consideration in American culture. Ironically, attempting to preserve the fishing way of life by insisting on laissez-faire policies may guarantee that the small, independent fisherman does go the way of the family farmer.

A serious problem caused by overcrowded fisheries is what economists refer to as "dispersion of rents." Many small-scale fishing operations are becoming marginal, unable to absorb the ups and downs of fish populations and fish prices, unable to compete with larger enterprises that can absorb these shocks, and therefore unable to stay in business.

Consequently, in the interest of maintaining the cultural value of small-scale fishermen, governments often step in with assistance programs, subsidies like those granted agricultural interests. But because fish are merely extracted, not cultivated like crops, these subsidies speed the process of depletion.

The primary interest of conservationists, and fishery managers for that matter, is not in social engineering. They do not and should not seek to sacrifice traditional ways of fishing on the alter of economic efficiency.

On the other hand, it must be acknowledged that our present situation of an excess number of fishermen exploiting limited and stressed fish populations is itself causing a radical re-structuring of the fishing industry. Any large-scale reduction in fishing effort and fishing mortality, necessary to bring catch levels into line with the productivity of the resource, will squeeze marginal fishermen out of the fishery.

There will be winners and losers no matter which path is taken. The relevant question is, will society plan and control the changing face of marine fisheries, or merely let the chips fall where they may? Doing the latter - allowing a laissez-faire restructuring of the industry strictly in response to the economic, not the biological, limits of the fishery - will mean survival of the fittest, with only the largest fishing operations staying in business.

Unquestionably, the implementation of any limited entry system will mean that some people who want to fish commercially won't be able to, and probably that many currently fishing will have to find something else to do. But these less palatable products of limited entry already pertain to the use of other natural resources. Indeed, one might say we are with marine fisheries now undergoing the fits and throes we've already experienced with management of other common property resources. To the extent we persist in thinking of ocean fisheries in different terms than other natural resources - allowing open access, no-fee fishing - this process will be all the more painful.

Appendix 2

PRIVATE PROPERTY AT SEA

Limited entry, by permitting a specific number of participants at the exclusion of others, automatically confers a type of property right to an individual, a preferential access to the harvestable resource. Some types of limited entry, such as individual transferable quotas, take that property right one step further by allocating specific shares of the resource to those permitted to fish. It is just that property right that is meant to provide the incentive to conserve for the long term by assuring the owner that the benefits of conservation will be available to those who practice it.

But that right must be carefully established for it to provide the appropriate incentives for conservation while avoiding some of the problems associated with private property. To advance fish conservation goals, this property right should have the following attributes and conditions:

1. Qualified Exclusivity - As envisioned, the right to fish is exclusive to those holding a permit. That is how a degree of "ownership" is established over the resource and the conservation incentive develops. However, fishing rights must be granted with certain constraints, e.g., with the understanding that it is a share of the catch, not an absolute number; the total allowable catch may change, and thus the share represent more fish or fewer fish. Conservation incentives are clearly established if fishermen are guaranteed a share of the resource rather than a specific quantity. Good management and wise use of the resources yields benefits that can be reaped by the fishermen who practice it. Poor management harms the resources and leads to lower allowable catches.

The key to success is an exclusive right to use a share of a resource and reap the benefits (and bear the costs) of its use. Outright ownership of the resource is not necessary and may in fact be a problem. Fishermen cannot be allowed to manage their shares independent of the other shareholders, as full ownership would allow. The ability to shift future harvests to the present in order to maximize profits - and a host of other independent decisions - would undermine the conservation goals.

Fish are perhaps somewhat unique because, while access to the resource may be controllable, ownership over individual fish or individual stocks is difficult if not impossible. What some fishermen do to their stocks can and often will affect stocks that others fish on, due to predator-prey relationships and the like.

2. Defensibility - The claim to a share in a fishery must be protected by law to offer proper incentives for conservation. If a shareholder has no expectation of maintaining his or her status as holding an exclusive right, there will be no incentive to build the resource for the future. On the other hand, the right cannot be absolute. The public must retain the right to revoke the share or otherwise penalize the shareholder if the resource is misused. There must be an incentive to play by the rules established by managers to achieve the goals of the quota-sharing system.

3. Enforceability - Shareholders need to trust that their rights are protected, and strict, tough enforcement will be needed to do so. Managers must be able to ensure that fishermen stay within their individual shares or quotas, and that those outside the system do not violate it. If the system works as intended, however, there is likely to be some self-enforcement, since the "property owner" has a vested interest to protect.

4. Transferability - Whatever rights are established must remain transferable. Fishermen who want to leave a fishery, for whatever reason, should be allowed to transfer or sell their share(s). Marketing of limited entry shares or permits would encourage those not efficient or profitable to exit and give those who wish to enter the fishery the opportunity to do so. It also allows those not offered an initial allocation a way into the fishery. Marketable transfers provide an additional conservation incentive, e.g., when stocks are high, the value of a given share will increase, providing an oppor-

tunity to cash in on the improvements. Transferability makes the system valuable to the initial owners - wealth is conferred on them by the government - and some fee system to recoup that windfall needs to be created.

5. Universality - Fishermen pushed out of one fishery are likely to end up in another. Fishing is a way of life that many prefer to pursue against sizeable odds. Since limited entry won't apply to all fisheries, there will always be some place else to go. Some argue that limited entry should be applied universally in order to prevent overflow from moving into unrestricted fisheries. Unfortunately, displacement may put pressure on fisheries to consider limited entry even though it may not be appropriate. Since it is not likely to be productive or efficient to apply limited entry universally, the potential impacts of displacement on other fisheries need to be carefully considered.

6. Flexibility - Limited entry schemes, like all forms of management, are experiments, so managers must retain the flexibility to change them as they learn what works and what doesn't. If rights within the system become entrenched, those politically and economically enfranchised by that system will resist change because of their investment in the *status quo*. Measures providing that flexibility need to be a part of the system from the start.

Once established, property rights are difficult to rescind. Fishing rights under limited entry would presumably be similarly tough to change. But if a particular program fails, removing or redefining that right may be necessary. Therefore the right must be carefully defined to avoid its becoming absolute.

The public must retain the right of ownership, the right to close down a fishery if it is warranted for biological reasons. Rights that are based on shares, with no guarantee that the allowable catch will always be above zero, provide a certain element of flexibility. However, there may be unforeseen consequences of rights-based fishing that need to be guarded against. It will be necessary to retain a qualified right to end a particular limited entry program if it fails to protect the resources; perhaps a sunset clause should be written into each program. No experiment, no matter how well conceived, should give away the public's resources permanently or withdraw the public's right to control how the resources are used.

The flexibility necessary to protect the public interest in fisheries will conflict to some degree with the similtaneous need to make fishing rights defensible. The degree to which the public can reverse privatization will reduce the expectation that future gains from current sacrifices can be fully recovered. There has to be a balance between flexibility and defensibility, with the public's interest in healthy oceans always the paramount concern. The terms of flexibility must be established upfront, before privatization occurs.

As a precaution, managers might consider reserving a share of the resource for conservation. A percentage of the total allowable catch could be set aside in the form of an unused share of the resource to be held by the public. It would act as a conservation buffer against uncertainties or inaccuracies in stock assessments or unpredictable fluctuations in stocks.

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WASHINGTON • ZURICH

GREENPEACE

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Statement of Greenpeace

for the hearing before the

Subcommittee on Fisheries Management
of the U.S. House of Representatives Committee
on Merchant Marine and Fisheries

on

Individual Transferable Quotas (ITQs or IFQs)

February 9, 1994

Mr Chairman:

Greenpeace appreciates this opportunity to express our concerns regarding individual fishing quotas (IFQs) to you and the subcommittee on fisheries management. Types of quota plans which privatize the resource are referred to as individual fishing quotas (IFQs), individual transferable quotas (ITQs) or individual vessel quotas (IVQs). For the purposes of this paper, the term, IFQ will be used to express the general concept of privatizing fisheries.

As you may know, Greenpeace is an international environmental organization with 1.6 million members in the United States and offices in 25 countries. The organization is dedicated to the protection of the planet and its myriad creatures and ecosystems. For a number of years, our organization has been involved in fisheries management for almost seven years. While our focus has been in the North Pacific, we were involved in the last Magnuson reauthorization and helped bring together the Marine Fish Conservation Network for the current effort.

Fisheries in the United States suffer from a variety of problems ranging from loss of habitat to overexploitation. The National Marine Fisheries Service (NMFS) reports that 65 (or 42%) of the 153 known fish stocks in federal waters are overexploited. Greenpeace does not believe that the numerous problems affecting U.S. fisheries can be solved by implementing a system of IFQs, and privatizing this public resource.

The current crisis in U.S. fisheries was predicted in the mid-1970s, and resulted in the passage by Congress of the Fishery Conservation and Management Act of 1976, (Magnuson Act). At the time of the implementation of the Magnuson Act, the status of fisheries in the United States warranted protection, and prudent conservation and management. Unfortunately, under the Magnuson Act, efforts to develop the U.S. domestic fishing fleet, through economic development assistance and elimination of foreign competition, forced conservation to the wayside. These incentive programs were developed in the form of low interest loans and preferential allocations, to encourage U.S. participation in fisheries development.

These priorities remain in force, and little has been done to improve the way in which fisheries are prosecuted or to provide for the sustainability of fish stocks. This has resulted in a situation where we now have too many vessels chasing a finite, and in many cases, decreasing amount of fish. Furthermore, little effort has been made to improve the manner in which fish are caught, (e.g. improving the selectivity of fishing gear). And, nothing has been done to offset the exorbitant costs of managing fisheries resources.

The National Marine Fisheries Service (NMFS) is responsible for the sound stewardship of our national living marine resources.

As such, it is the responsibility of NMFS to weigh all concerns, including social and ecological, when addressing fisheries management issues and decisions.

By supporting and promoting IFQs, which would transfer the ownership of our national fisheries to private entities, NMFS apparently believes that fisheries management will be made simpler. In fact, NMFS will be ceding all or most of its authority and responsibility to manage and conserve U.S. fish stocks in this transaction.

Greenpeace believes, for the reasons listed below, that IFQs will not solve the myriad problems facing U.S. fisheries:

a) IFQs do not have conservation oriented objectives; they are largely profit driven. Because the fishing fleets of the world are over-capitalized and over-subsidized, there is a rush to secure economic investments in the fleet. However, as has been illustrated by those countries that have adopted IFQ regimes, IFQ plans will double or even triple current implementation and enforcement costs. Taxpayers will once again bear the burden of funding the implementation of a program that does not solve the numerous problems currently facing U.S. fisheries. Moreover, taxpayers should not be required to fund a program which privatizes what was previously a publicly held resource.

b) IFQ systems do not resolve the problems of inherently "dirty" fisheries (i.e. those fisheries with high levels of bycatch and discards). Such fisheries will not be cleaned up by IFQs. Instead, they will be legitimized, as historical bycatch levels are allocated so that the target species can continue to be caught. Additionally, because each vessel operator will have a given quota, the incentive to "high grade"- keep only the most marketable fish - will intensify and discards will increase dramatically.

c) Supporters of IFQ systems argue that they consolidate the number of fishing vessels in operation. But this does not address the problem of "capital stuffing"; improving the catching capacity of those vessels that participate in a given fishery. The issue of overefficiency will not be addressed.

d) The "race for fish" will not be slowed or stopped under an IFQ system. Fisheries that currently operate within a specific window of time, e.g. the pollock roe fishery, will continue to do so. Further, because of the high value of pollock roe, most vessels will continue to fish their quota during the spawning season.

e) IFQs will facilitate the concentration of fisheries resources into the hands of large corporations and will virtually eliminate small-scale fishery operations, which arguably contribute substantially more in economic and social terms to the coastal

communities in which they operate.

f) Upon implementation of IFQs, fishing will no longer be a privilege which is contestable by citizens. The privatisation of our fisheries will eliminate citizen participation, including the right to challenge, fishery management decisions. The ability to challenge fishery management decisions in a court of law will be nearly impossible on the basis of property rights.

Open access fisheries are difficult to manage. As vessels continue to enter a given fishery, seasons become shorter, total allowable catches (TACs) are exceeded, and inevitably more harm is caused to the resource. Limited entry programs are the alternative to open access, yet NMFS has failed to proactively limit participation. There are numerous types of limited entry programs which may address some problems in each fishery. IFQs are not the only option.

Again, Greenpeace does not support NMFS' attempt to relegate its authority over living marine resources by giving away the marine resources of the United States and creating private holders whose overriding concern is with maximizing short-term profits. NMFS' failure to uphold the stewardship of our marine resources is no excuse for NMFS to yield its obligation to conserve our fish populations altogether.

Rather, we advise NMFS to move forward proactively by adopting and implementing suggestions as put forward in its 1991 Strategic Plan for the Conservation and Wise Use of America's Living Marine Resources. Interestingly, NMFS attempts to make a fundamental departure from the approaches of the past and acknowledges that effective conservation encompasses the ecosystem as a whole. In particular, it calls for:

1. Controlled access to fisheries to reduce the tendency toward excess fishing capacity, economic waste, conflicts between groups, and industry pressure to make "risk prone" decisions;

2. Development of more selective fishing practices to reduce bycatch;

3. Implementation of a cohesive strategy, built on all applicable legislative authorities, to protect and restore marine ecosystems;

4. Reduction of uncertainty by greatly expanding the scientific information base upon which decisions are based;

5. Risk averse decisions in the face of uncertainty (i.e., erring on the side of conservation, not resource depletion). Obviously missing from this list is the consideration of biological interactions. There is a pressing need to manage marine exploited species in the context of the ecosystems of which they are an integral part, both to achieve sustained use of

living marine resources and to protect non-exploited species and the integrity of their interactions.

We are at a critical juncture where we have a choice; either drive our remaining fish stocks into depletion or move toward sustainable fisheries management.

Queen Anne Fisheries, Inc.
1939 Eighth Avenue West
Seattle, Washington 98119
(206) 284-9158

F/V MASONIC
Mark S. Lundsten, Operator

1/24/94

The Honorable Thomas Manton, Chairman
Fisheries Management Subcommittee
Merchant Marine and Fisheries Committee
534 Ford House Office Building
Washington, D.C. 20515

Dear Chairman Manton,

I am writing to thank you for attending the meeting in Seattle on January 17 with Mike Lowry, Jolene Unsoeld, Maria Cantwell, and members of our fishing industry. I appreciate the willingness of you and of our state's delegation to work with fishermen in order to figure out our problems.

I am the owner/operator of a longline vessel, the Masonic, am a Trustee of Fishing Vessel Owners' Association in Seattle, and have been an active participant in the campaign for the IFQ system now being implemented for the sablefish and halibut fisheries. Believe me, we all look forward to fishing under that system in 1995.

In the last year I also have become involved as a "volunteer" Board member with a different group of fishermen - Independent Fishermen For Fair Quotas (IF^3Q), a group of trawl catcher-boats, crabbers, freezer longliners, a factory trawler, and a processing mothership. Most are members of either United Catcher Boats, Alaska Crab Coalition, or the North Pacific Longline Association.

Since early December, I have taken on the duties of Director for IF^3Q until I go back fishing later this spring.

In that time, we plan to work as much as possible for an IFQ plan for groundfish and crab for the North Pacific fisheries still under open-access management. More a joint campaign than a traditional fishermen's organization, we plan to work as long as necessary with as many fishermen as we can to help develop that plan.

The passage of the halibut and sablefish IFQ program is a credit to our fisheries management system. I hope we can work out another system for crab and for the other species of groundfish in the North Pacific.

Sincerely,

Mark S. Lundsten

77-904 O - 94 - 5

ALASKA OCEAN SEAFOOD
LIMITED PARTNERSHIP

February 4, 1994

The Honorable Tom Manton
Chairman
House Fisheries Management Subcommittee
534 Ford House Office Building
Washington, D.C. 20515

Re: Magnuson Act, ITQ System and Initial Allocations

Dear Congressman Manton:

I am submitting the following written testimony and requesting that it be entered into the official hearing record for the Subcommittee's February 9, 1994 Magnuson Act hearing regarding Individual Transferable Quota (ITQ) management systems.

ALASKA OCEAN SEAFOOD, LP is the owner and operator of the factory trawler ALASKA OCEAN. At 376 feet in length our vessel is the largest and one of the most modern surimi factory trawlers in the UNITED STATES and represents an initial investment in excess of $60,000,000. The ALASKA OCEAN operates in the Alaska Groundfish industry for a primary target species of Alaska Pollock.

For decades the Alaska fisheries have been managed under an "open access" system. As a result each fishery has experience overcapitalization and "race for the fish" type seasons that got shorter and more intense with increased effort. An ITQ system would eliminate many of the serious economic, safety and operational problems associated with this system. Unfortunately the North Pacific Management Council did not move forward with ITQ's and continues to be bound by special interest politics.

We strongly support instituting an ITQ system for the Alaska Pollock fishery.

We believe just as strongly however that initial quota shares should be based on "present participation".

2415 T Avenue • P.O. Box 190 • Anacortes, WA 98221
Phone: (206) 293-6759 • Fax: (206) 293-6232 • Telex: 883481

Congressman Manton: February 4, 1994, page 2

Harvester sectors, shoreside processors and the State of Alaska are clearly divided on the allocation of initial quota shares.

However, we all made our investments over the years relying on those existing laws that regulated the fishery. Allocating based on **"present participation"** is consistent with those regulations and would give each no more or no less than they have now. Allocating as some would have based on **"catch history"** from the onset of the Magnuson Act would retroactively change the laws and create huge winners and losers. Early entry catcher vessels and factory trawlers would received huge "wind-fall" shares and late entries, like the ALASKA OCEAN and others, would be driven to bankruptcy. Those vessel owners that support **"catch history"** were paid for their efforts. Most are still in the industry and viable because had they had the chance to pay down their investments with little competition.

We support ITQ but can find no social, legal, economic or national reason to base the initial shares on anything other than "present participation".

Sincerely yours,

ALASKA OCEAN SEAFOOD, LP

Jeff Hendricks, General Manager

FACTORY TRAWLER ALASKA OCEAN

Owner:	Alaska Ocean Seafood, LP Anacortes, Washington
Commissioned:	1990
Class DNV:	+1A1 - Ice C - Stern Trawler - EO - Reefer
Length Overall:	376 feet
Breadth:	60 feet
Gross Tons:	7,419
Prop HP:	6,250
Speed:	14 knots
Accommodations:	120 crew
Industry:	Alaska Pollock, Pacific Hake
Products:	Surimi, Fishmeal, Roe, Fish Oil
Hold Capacities:	2,400 MT - Surimi 450 MT - Fishmeal 100 MT - Fish Oil
Designed:	Guido Perla & Associates, Inc. Seattle, Washington U.S.A.

Cover Photo: Matt Brown, Anacortes, Washington • Location: Elliot Bay, City of Seattle Skyline, Washington

ıchorage Daily News Saturday, January 15, 1994

BUSINESS

Bottom-fish, crab IFQs put on hold

By HAL BERNTON
Daily News business reporter

The North Pacific Fishery Management Council, in an abr··pt change of course, voted . .iday to shove onto the back burner a controversial plan that would vest bottom-fish and crab-boat operators with potentially billions of dollars' worth of harvest rights.

The 6-5 vote by the council ended — at least temporarily — a steady march toward a system in which each boat fishing would be allowed to catch a fixed share — or individual fishing quota — of the entire catch. Proponents of the plan claim it would reduce waste, increase safety and improve the finances of the troubled North Pacific trawl fleet.

The current system allows any boat to fish in a race to grab as much as it can before the fleetwide catch level is reached.

On Friday, the council directed its staff to "move as quickly as possible" toward developing a different plan. This plan would limit the number of boats that compete for fish — similar to what's done in the Alaska salmon industry — but might not do anything to slow the race. The IFQ plan would be studied, but at a slower pace.

Bottom fishing and crabbing together are the bigger fisheries in Alaska, based

Please see Page D-5, SHA

SHARES: Fishery council backs off plan to divvy up bottom fish, crab harvests

Continued from Page D-4

the value of the catch.

The trawl fleet is largely based in Washington, and the vote infuriated that state's four representatives on the council. "I think it's a tragedy," said Alan Millikan, a Washington state representative. "We're postponing until the 21st century our hopes of having a rational management system."

The decision could benefit Alaska on-shore fish-processing plants, whose representatives have feared that a "share" plan might cause less fish to flow to them.

The council is a mix of one federal, three state and eight industry officials who develop harvest plans that are passed onto the U.S. Commerce Department for final approval. They are sworn to vote in the national interest, but industry officials are allowed to vote on issues that they — or the groups they represent — have a direct financial stake.

On Friday, council members altered course amid intense lobbying by fishing industry groups with big stakes in the North Pacific harvests. Shore-based processors, some factory longliners and other groups feared they might lose financial advantage in some options considered for the share system. And others expressed concerns that the system was so complex it would take years to develop, and the industry needed an alternative that could be put into place more quickly.

Votes in favor of the change were cast by five Alaska fishing industry officials and the state representative from Oregon.

"It's obvious that the ... plan will take far longer (to develop) than we thought," said Rick Lauber, a Juneau lobbyist for shore-based processing plants who serves as the council's chairman. Lauber said he was swayed by a 17-2 vote by an council advisory panel of industry and other officials that favored the change in direction.

But the state representative of the council, Earl Krygier, broke ranks with the rest of the Alaska delegation to vote against the change in direction. During a marathon week of painstaking revisions, state officials had amended the plan to include options that would protect shoreside plants and reduce waste and accidental catches of prohibited species, said Dave Benton, another state fishery official. And the state could try to bring the issue up for another vote at meeting late this year.

The council has been discussing share systems for the last half decade, and actually created a share plan for halibut and black cod scheduled to go into effect next year. In recent months, it has been seriously grappling with the even more complex task of developing a share plan for crab and bottom-fish fleets that could be put into place as early as 1996.

The share system has been backed by the federal National Marine Fisheries Service that does the hands-on management of the harvests. And its representative to the council — Steve Pennoyer — opposed the change in direction approved Friday. He said that setting up a limited-entry system was not a short-term solution but would require a major new effort that would take several years to accomplish.

PUGET SOUND BUSINESS JOURNAL , 1994

trawlers

Council deals another blow to factory

By STEVE WILHELM

Washington's factory trawler fleet, already staggering from the effects of overbuilding and low fish prices, received an unexpected body blow from the North Pacific Fishery Management Council last week.

Months of work and public hearings were reversed in an instant on Jan. 14, when the council voted against rapid implementation of a long-proposed system of individual transferable quotas. That system has been favored by many in the troubled local fleet of 60 factory trawlers as a way to limit competition while buoying their precarious finances.

Instead, the fishery council opted to put on the fast track an alternative plan called "licensed limitation."

"It's a 180-degree reversal of what their previous decisions have been. It's turned the whole industry upside-down about what's going on with this council," said Steve Hughes, bottomfish consultant for Natural Resources Consultants Inc. in Seattle, shortly after the Anchorage meeting.

But Vince Curry, president of the Pacific Seafood Processors Association, saw the vote more as a postponement of the increasingly complex process of divvying up the fishery through transferable quotas, so nobody will be left out.

"We don't want to see a system that gives any sector an unfair advantage," said Curry, who represents the shore-based processors, which are historic rivals of the factory trawlers, and which have a combination of Washington and Japanese ownership.

While the distinction between two methods of allocating fish may seem arcane to those outside the industry, it is worth hundreds of millions of dollars to business interests focused on the world's richest fishing grounds, the Bering Sea.

The Washington-based factory trawler fleet is worth an estimated $1.6 billion, and generates annual revenues of about $500 million, as well as supporting local shipyards and suppliers.

Transferable quotas allocate fish by assigning a quota to each vessel or other entity based on its historic share of the catch. The owner of that quota is then free to catch those fish at any time during the year, theoretically allowing owners to schedule their season according to economics. The current "Olympic" system now crams the entire year's allocation of some bottomfish into a few weeks of frantic fishing, taking a toll on the resource, gear, other fish species and even human lives.

The licensed limitation program endorsed this month by the fishery management council is actually a hybrid of the Olympic system. It differs by licensing just a limited number of vessels to participate in the annual frenzy, in an attempt to balance fleet capacity and the resource.

Representatives of Washington's factory trawler fleet expressed anger about the decision, and fear about its implications for the industry here.

"It's tragic," said Wally Pereyra, the sole representative of Washington's factory trawlers among the council's 11 members. "I think they (the council) feel that by delaying this thing, they can introduce other measures that will further cripple the distant water fleet, and gain other advantages over them. With the Alaska majority on the panel, they bullied their way through."

"It's a real shock," said Joe Blum, executive director of the American Factory Trawlers Association. "Once again it's a signal that the North Pacific Council doesn't really care about many of the things they profess to care about."

People familiar with the finances of Washington's factory trawler fleet said the decision could push more marginal firms into insolvency, following a spate of bankruptcies last year.

After rapid growth in the late '80s and early '90s, the Seattle-based fleet is too large for the total allowable catch of Alaska bottomfish. This problem has been exacerbated by the current council-mandated system of splitting the pollock 65-35 between offshore and onshore fish processors, which has reduced the catch available to the factory trawler fleet.

The upshot has been that fishing days for the highly leveraged fleet have been reduced from 300 annually to about 100, in some cases dropping below the volume required for profitability.

The last hope for many owners and creditors was that they would be able to cash in on their vessels' history if transferable quotas were implemented.

"A lot of bankers were letting things slide with the anticipation that these ITQs would be issued," said Bob Alverson, executive director of the Fishing Vessel Owners Association, and one of the minority on the council who voted for transferable quotas. "I expect that after the 'A' season, we will probably see some (U.S.) marshal stickers on the fleet. It really cuts them off at the knees, financially."

U.S. marshals can seize a financially troubled boat at the behest of creditors.

But Curry sees the current shakeout as a natural consequence of overbuilding by the fleet.

"The problem with factory trawlers is that they've built twice as many boats as have been justified, and they've created a very severe problem for this industry," he said. "They're driving ITQs because it's one way to take a public resource and use it to get them out of their bad investments."

What was surprising about Friday's vote was that it followed days of testimony on transferable quotas, both in Anchorage and at the council's December meeting in Seattle. At the Seattle meeting there seemed to be a general consensus that transferable quotas were inevitable, and most testimony was by industry sectors seeking a portion of the quota.

FOR THE RECORD

For The Record is an alphabetical listing of business-related items gleaned from press releases, court documents and other sources. Calendar, Classes and Seminars, and Convention notices must be submitted to Records Coordinator Brian Chin at least two weeks prior to date of publication.

BANKRUPTCIES

Deep Sea Harvester Inc.
5305 Shilshole Ave. N.W., Suite 200, Seattle 98107
Operator of crab catcher/processor
John R. Boggs, president
Chapter 11
Assets: N/A
Debts: $3,993,099
93-10188

Jody Ann Fisheries Inc.
5305 Shilshole Ave. N.W., Suite 200, Seattle 98107
Operator of fishing vessel
John R. Boggs, president
Chapter 11
Assets: N/A
Debts: $1,250,569
93-10189

Gulf Mist Inc.
5305 Shilshole Ave. N.W., Suite 200, Seattle 98107
Catching and processing of groundfish
John R. Boggs, president
Chapter 11
Assets: N/A
Debts: $8,287,094
93-10190

Karin Lyn Fisheries Inc.
5305 Shilshole Ave. N.W., Suite 200, Seattle 98107
Operator of fishing vessel
Richard F. Hastings, president
Chapter 11
Assets: N/A
Debts: $2,563,477
93-10191

Deep Sea Fisheries Inc.
5305 Shilshole Ave. N.W., Suite 200, Seattle 98107
Catch, process and sell seafood; manage other companies
John R. Boggs, president
Chapter 11
Assets: N/A
Debts: $11,812,241
93-10192

THE SEATTLE TIMES **SECTION B** FRIDAY, DECEMBER 10, 1993

ROSS ANDERSON / *Times editorial columnist*

Legacy of the fish council: 500,000,000 lbs. of waste

JUDGING by the strain on his hydraulic winches, the skipper believed he had netted 20,000 pounds of fish, worth thousands of dollars. As his mammoth net reached the wind-frothed surface of the Bering Sea, the fisherman scrambled down to the deck to inspect his catch.

A 10-ton catch is an amazing sight — thousands of silvery, quivering fish crammed into a net 30 feet long and perhaps 15 feet across, like an enormous, quilted whale.

The skipper, however, took one look, shook his head and instructed the crew: "Dump it!" In a few minutes, 10 tons of fresh seafood became 10 tons of biodegradable garbage.

Why? "That net's full of pollock," he said. "We're rigged to process rock sole."

This was no isolated mistake. During my week on board that factory ship, I saw more fish dumped than kept, callous waste measured by the ton, if it was measured at all.

Seattle's high-tech fishing fleet — large boats and small, in-shore and offshore — is both an international model, and a national disgrace.

Last year alone, fishermen in the Bering Sea and Gulf of Alaska dumped more than 500 million pounds of fish. That's more than was caught by all U.S. fishermen in the troubled North Atlantic. It is enough to feed 250 million Americans a healthy seafood dinner.

For years, fishermen have shrugged off these statistics as an unfortunate cost of doing business.

Their business. Our cost.

There is an element of waste to any business. Farmers occasionally plow crops into the ground to avoid glutting their markets. Loggers have been criticized for leaving trees too small to mill.

But much of that 500 million pounds of waste is avoidable. Fishermen select gear and methods that are prone to catching the wrong species. Of 114 million pounds of fish caught in the rock sole fishery last year, 70 million pounds were discarded — a staggering 61 percent of the total. Some accident.

This is complicated by the way government chooses to regulate the fisheries. Trawl fishermen are *required* to discard halibut, salmon and crab — mostly to protect the interests of competing longliners or other traditional fishermen. In 1992, this accounted for discarding 20 million pounds of halibut and 20 million crab — dead or alive.

The American fishing industry remains a curious museum piece, a lingering case study of backward management and irrational economics. To insiders, it is complex; to outsiders, it is insane. They're both right.

Other public resources, such as oil or timber, are subject to market forces. The government allocates the resource by selling it to the highest bidder, who presumedly will harvest it in the most efficient manner possible.

Fish, however, remains an open-access resource, free for the taking. This is defended as sound social policy. In fact, it's a throwback to 19th century colonial economics. "This entire business operates under a charter granted by Queen Elizabeth," says one businessman-observer.

When a resource is both free and valuable, there are bound to be too many takers. The American buffalo was an open-access [illegible]til hunters got carried away.

The North Pacific Fishery Management Council, the federal panel that is supposed to manage this problem, instead has ignored it. They dabble in the politics of who-gets-what while the overall fleet continues to breed a new generation of buffalo hunters.

To prevent over-fishing, the council has shortened fishing seasons. But time is money, so fishermen process only their highest-value catch, dumping the lower-value stuff so they can clear the decks and try again for the big money. The result is 500 million pounds of chaos, a mad derby that encourages waste.

Naturally, all this shortsightedness costs us taxpayers millions of dollars for fisheries research, regulation, enforcement and mismanagement.

We're even paying the hotel and bar bills this week as the fishery council meets in downtown Seattle. Finally, the situation has deteriorated to the point that even the fishery council is under some pressure to respond.

They have talked about new rules, requiring fishermen to process everything they catch. They have talked about a new quota system, which would hand over ownership of the resource to fishermen, based on their historical catch. Look for another two-year study in the near future.

There is a simpler and quicker solution to all this: Stop giving the resource away. Divide the fishery into shares, and auction it off.

Human ingenuity is rooted in profits. If fishermen actually paid for what they catch, they would magically discover new, efficient ways of targeting rock sole without scooping up pollock. They would develop more efficient boats and fleets, capable of processing both species at once. If waste costs money, there will be less waste.

But free-market solutions are not on the fisheries agenda. The federal fish czars won't even study the idea of asking fishermen to pay their own way.

And why should they? So far, taxpayers have been willing to subsidize a bankrupt and wasteful status quo.

Ross Anderson's column appears Friday on editorial pages of The Times.

NATIONAL FISHERMAN FEBRUARY 1994

PACIFIC COAST WATCH

Council should consider quota action

By Brad Matsen
Pacific Editor

In December, the North Pacific Fishery Management Council met in Seattle for the first time in its 16-year history. Until the last reauthorization of the Magnuson Act in 1990, the council was prohibited from holding its plenary sessions anywhere but within Alaska, a bitter pill for Seattle's distant-water fleets. Now, however, at least one of the council's five or six meetings each year will be held in either Oregon or Washington.

The same week the council was meeting, veteran *Seattle Times* fisheries writer Ross Anderson wrote a column headlined, "Legacy of the fish council: 500,000,000 lbs. of waste." In it, he criticized open access to the fisheries, a management system that requires discards of bycatch and the North Pacific Council in general. He called for an auction of the resource and submission to the dynamics of the open market as a solution.

Meanwhile, over in Ballard, council Chairman Rick Lauber gave the keynote speech at the Norwegian Commercial Club's Fishermen's Night gala. Lauber shared the bill with a vigorous cocktail hour, a great salmon dinner, a facile master of ceremonies and a pair of old-country comedians, Uncle Torvald and his straightman.

Lauber was anything but funny, though, as he related the travails of managing fisheries with wide-open competition on the grounds and battalions of lawyers and lobbyists on the beach. The problem is, he said, that the various gear groups, investors and regional factions hamper rationalization of the fisheries or the councils that manage them. Waste is all but guaranteed under an open-access system with compressed seasons that don't give fishermen the time to select grounds and methods that reduce bycatch and discards. Now, we're in irons with bycatch caps shutting down most fisheries before their quotas are taken, and a half-billion pounds of discards showing up in newspaper headlines that are sure to awaken the American public.

But because the councils and participants in the fisheries didn't seize the opportunity to do some much needed social engineering 15 years ago, vesting access to the resource has become impossibly complicated. Everybody who owns, runs or works on a fishing boat claims an entitlement, and nobody wants to compromise on the biggest issue of them all, ownership of the resource in perpetuity.

Current proposals for awarding quota shares in the groundfish and crab fleets seem like longshots at best. The council's first attempt to impose a quota-share system in the smaller, less complicated halibut and blackcod fisheries took nine years. That system finally cleared all administrative hurdles and is set for imposition in 1995, but what will likely be a protracted legal blizzard started the week the council met in Seattle, when opponents filed their first lawsuit.

Maybe Ross Anderson is right. A quota auction might be the only way to go if we want to rationalize the fisheries of the North Pacific in this century.

Alaska Fisherman's JOURNAL January 1994

EDITORIAL

Harvest Priority

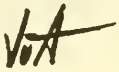
Don't sweep it under the rug

License limitation, ITQs or the status-quo madhouse. Those are the three options before the North Pacific Fishery Management Council as it moves ahead with "comprehensive rationalization" of the groundfish harvest off Alaska. That's the best nearly a decade of expert input and political horse-trading has been able to come up with. Or is it?

When the NPFMC met in Seattle in December, they were presented a sketch of a harvest priority system developed by the Alaska Marine Conservation Council. The plan proposes to withhold a percentage of the annual TAC from the open-access fishery and reward the additional quota to those harvesters who can meet or beat a negotiated bycatch standard. The set-aside could be increased over time, and the cleanest, most efficient fishermen within each gear group could gradually bid down the bycatch rate to distance themselves from the "dirtier" competition.

Instead of granting harvest shares to those who have historically boated the greatest catch—at whatever cost to the resource—the system would reward those who can adapt fishing savvy and modern technology to a more balanced ecological advantage. The statistical burden would shift away from an enforcement agency charged with proving fishermen wrong to a fleet of operators eager to prove themselves right. Observers might even be welcomed aboard.

Market forces would establish equilibrium. Ecological risk takers would have something to gain. The fair cost of bycatch could now be factored in, and the burden of excess would be born by the individuals who can't cut the mustard, not by entire fleets. Maybe it's just a pipe dream, but it's too beautiful to ignore.



A NATIONAL AGENDA TO PROTECT, RESTORE AND CONSERVE MARINE FISHERIES

THE MARINE FISH CONSERVATION NETWORK

Steering Committee:

Center for Marine Conservation
Greenpeace
National Audubon Society
National Coalition for Marine Conservation
World Wildlife Fund

Minimize Bycatch Problems

The use of non-selective fishing gear - essentially, any type of gear that catches large amounts of unintended fish and other marine species - causes intolerable waste and serious conservation problems. Worldwide, discarded bycatch amounts to an estimated 12 to 20 billion pounds of sea life every year, or 20% of the overall catch.

Examples of non-selective gear include large high-seas drift nets that catch virtually anything that tries to swim through the netting, or trawl nets that are used to drag the ocean bottom, scooping up all species in the path of the net. Perhaps the most egregious example is the Gulf of Mexico shrimp trawl fishery, where 9 to 11 pounds of juvenile fish are caught and thrown overboard for every pound of shrimp that is taken.

The astronomical number of fish killed as bycatch, usually unreported, is not just a problem of waste. Bycatch contributes to overfishing. For instance, red snapper in the Gulf of Mexico, one of over a hundred species caught in shrimp trawls, is severely depleted primarily because of the enormous number of young fish killed as bycatch.

The Magnuson Act is largely silent on the subject of bycatch and dead discards. Bycatch is restricted only where it threatens a species protected under a non-fishery statute (e.g., dolphins and sea turtles) or where it includes species highly valued and sought after by competing fishermen.

The Magnuson Act should include a definition of undesirable bycatch and make it a national policy to minimize the negative impact of bycatch on fish populations and the marine ecosystem. Researchers should accumulate better data on the extent of bycatch and its impact in each fishery, and managers should include provisions to reduce the incidental capture of fish and other marine animals in all fishery management plans.

More research needs to be conducted in the area of gear selectivity, including the development of bycatch-reducing technologies. Management strategies should include incentives for fishermen to increase gear selectivity or use more selective methods of fishing.

WASTED HARVEST

4/7/91 Anchorage Times

As thousands starve around the world, millions of pounds of high-protein fish are being killed in the north Pacific

STORIES BY JOE HUNT

Huge factory trawlers raking the seabeds off Alaska are too deadly efficient. So far this year, they have killed and wasted enough fish to feed each Alaskan a high-protein dinner for more than three months.

Some say this waste — in a world where many go hungry — is a national scandal. Others counter it is just the cost of doing business.

The vessels trail thousand-foot nets to scour ocean bottom in the Bering Sea and the Gulf Alaska and haul in tons of pollock, cod and other bottom fish.

About 10 percent of the fisheries' 5 billion-pound quota is thrown overboard. Dead.

The fleet has wasted 159 million pounds of edible fish in the first 11 weeks of this year, says the North Pacific Fisheries Management Council.

Larry Cotter is chairman of the bycatch committee for the fisheries council, which sets the regulations for the trawling industry.

"In my own opinion, we are wasting an enormous amount of fish," Cotter said. "That is unconscionable. If they learned about this Outside, it would become a national scandal, a disgrace."

But discarding fish is an economic reality of the fishery, dictated by world markets and prices, said Bert Larkins, director of the American Factory Trawler Association. If trawlers could avoid catching unwanted species or fish too small to process they would, he said.

"There is not only the social stigma of throwing fish back," Larkins said. "There's also an economic penalty because it takes a lot of manpower to do that.

"Any entrepreneur who is throwing away a percentage of his raw product is desperately looking for a way to utilize his whole catch. There's a real incentive for him to do that."

The trawlers target pollock, cod, sole, flat- and other bottom fish for sale in Japan.

But their nets are indiscriminate.

A trawler net trails a vessel like sock. Its mouth may be more than 200 feet across, with weighted wheels to roll it along the muddy bottom and floats at the top to keep its mouth open.

Federal law requires that tons of high-value crab, herring, halibut and salmon, inadvertently caught and killed in the nets, be thrown back as bycatch.

But trawlers also toss back fish they are authorized to take. Industry insiders excuse the waste, saying the fish are the wrong size for processing machinery, that they are damaged in the enormous net-loads hauled from the bottom or because no profitable markets exist.

During the Bering Sea bottom fish season, which started Jan. 1, federal observers recorded 144 million pounds of cod, sole, flounder, flatfish and other species tossed overboard. Another 15 million pounds have been discarded in the Gulf of Alaska.

The public tends to focus on the bycatch, but the waste of low-value bottom fish is the bigger moral issue, Cotter said.

He estimates 400 million to 500 million pounds of bottom fish will be tossed overboard by the end of the season.

This is in addition to a cap of 16 million pounds of halibut, 4 million tanner crab, 200,000 king crab and 833 tons of herring the trawl fleet will be allowed to catch and toss back this year.

Assuming one-third of that poundage represents fileted meat, that is roughly enough to provide every Alaskan with 1 pound of filets a day for a year.

"The real rape in the ocean right now is waste," Cotter said. "Prohibited species catch is the sexy part of waste, but finfish discard is absolutely appalling.

"The factory trawler is without question the most efficient harvesting machine on this planet. But when it comes to processing what it catches, it's extremely inefficient."

Trawlers net so many fish, operators can be picky about what they keep, processing only the most profitable grade of fish and tossing back the rest, he said.

Pollock filet machines are set for a certain size of fish. So far this year, the industry has tossed back 69 million pounds that was too small or too large to be efficiently processed, he said.

"It's a crime the amount of fish discarded," said Mandy Merklein, a fisheries observer on contract with the National Marine Fisheries Service. "It doesn't seem right we have to discard that much fish. Even the processors hate it. No one is happy about it."

Merklein is a veteran of 20 trips on foreign and American vessels in the Bering Sea and the Gulf of Alaska.

"I've been on boats where I've thrown more overboard in value than what we kept," Merklein said. "It just seems so stupid. What it really comes down to is bottom-dragging is not very clean."

An observers' primary job is to document the waste, providing weekly reports on bycatch to ensure trawlers do not exceed their quotas. In 1990, the first year observers were required aboard American trawlers in the North Pacific, 513 observers monitored 286 vessels.

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THE AMERICAN factory trawler industry in Alaska is still in its infancy, having taken over the fishery from a well-established foreign fleet in the last 10 years. Council members, biologists and fishermen say the industry is learning how to target its preferred catch without killing and wasting unwanted fish.

Officials say they are optimistic many of the problems will be solved during the 1990s. But the process seems unbearably slow, they admit — especially when raging controversies are so widespread.

- Fishermen are edgy about a plummeting halibut population, reducing their harvest year after year. Meanwhile, factory trawlers will take 16 million pounds of halibut this year.
- Interception of king salmon on the high seas has brought the impact of factory trawlers home to the Bristol Bay, Cook Inlet and Southeast Alaska where rivers are prized for world-class sport fishing. During the first 3 months of the Bering Sea fishery this year, 28,000 juvenile king salmon were killed and thrown back. Another 31,000 were killed in the Gulf of Alaska.
- Bering Sea crab fishermen, starting their comeback after the crash of the king crab population in the early 1980s, are angry because trawlers are allowed to kill 200,000 of the highly sought crab and 4 million of the lower-priced tanner crab each year.
- The government's requirement that crab, salmon, herring and halibut be thrown back is viewed as market protection by some and waste by others. Critics say they would rather those species be sold, with the profits used to fund research to reduce waste.
- Onshore processing plants, providing jobs in Alaska's coastal communities, say they are mostly shut out by the Seattle-based factory trawlers. The feud has spawned a proposal that would require a 50-50 split between onshore and offshore processors.

Controversies are popping up faster than solutions can be found. "The tendency over the last few years is things seem to be getting more polarized, worse really," said Larkins of the American Factory Trawler Association.

Virtually nobody condones the waste. If the trawlers do not find a solution, the fisheries council may someday force action.

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"I think we need to consider implementing a program that prohibits discards," Cotter said. "We may have to say 'If you catch it, you have to process it.' "

Trawlers could install meal plants to grind up the unsalable fish, creating fertilizer and animal feed, he said.

Discarding fish is more of a social or aesthetic problem than a threat to the species, Larkins said. It is popular to condemn the waste because there are starving people in the world, but none of those fish would make it to the struggling Third World countries that need them, he said.

"It's not as if those fish being thrown back are being taken out of somebody's mouth," he said. "They would never have had them in the first place."

Larkins said as long as there is no biological threat to the species, the waste is not a moral issue. It is similar to the waste in the timber industry or in vegetable farming, he said. "Whether or not you catch them and throw them back or leave them in the water in the first place, to me there's not much difference," Larkins said.

Other fishermen also discard fish, Larkins said. Halibut longliners commonly throw back cod and other species, he said. Longliners in Southeast Alaska cannot target king salmon without also snagging and wasting dogfish, he said.

Dr. Jim Brooks, deputy director of the National Marine Fisheries Service in Juneau, said nothing is wasted in the sea. Discarded fish become nutrients, fodder for other species in a complex food chain, he said.

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UNTARGETED SPECIES are thrown overboard in fisheries in Alaska waters, the Gulf of Mexico and the North Atlantic. "We could be talking about 3 (billion) or 4 billion pounds a year," said Harry Upton of the Center for Marine Conservation in Washington, D.C.

The Gulf of Mexico shrimp trawl fishery alone accounts for 1.1 billion pounds of unprocessed waste, he said.

"I think in fisheries we're looking at some extreme problems that have been neglected," he said. "It's not something people have taken up the cause for yet."

The combined political muscle of the fishing industry on both coasts has made change come slowly, he said.

The Magnuson Fishery Conservation and Management Act of 1976, which set up the American trawl fleet by putting all waters within 200 miles of the coast under U.S. control, spells out the process for regulating fisheries in federal waters.

The act, enforced by the National Marine Fisheries Service, requires regulators to consider biological, economic and social factors. The economic impact on the industry often overrides social concerns, Upton said.

"My feeling is we've shifted too far to the benefit of the user groups and the public interest in some cases has been neglected," he said.

The Magnuson Act, after 14 years of practice, essentially "replaced foreign overfishing by domestic overfishing," concluded a report released April 1 by the Center for Marine Conservation. The act set high principles and showed promise for a well-organized U.S. fishery, the study said. But it has exacerbated U.S. fisheries problems, it concluded.

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THE NORTH Pacific Fisheries Management Council does not have the necessary staff to handle the many issues it faces, said Arni Thomson, director of the Alaska Crab Coalition. "And if the analysis doesn't get done, then who wins? The factory trawlers," he said.

United Fishermen of Alaska, the largest organization of commercial fishermen in the state, has asked the Department of Fish and Game to assist the council with its scientific analysis to speed up the process. Thomson is chairman of the group's Bycatch Committee.

Cotter said Alaska's bycatch problem is caused by fishermen who do not want their rivals on the high seas to profit by catching prohibited species. Their least-of-two-evils is to allow the valuable fish to be wasted.

"The reason is political," Cotter said. "That's all there is to it," Cotter said.

The millions of pounds of bycatch in Alaska waters is incidental to the 5-billion-pound quota of pollock, cod, sablefish and other bottomfish expected to be harvested this year. But to the crabbers, halibut longliners and salmon fishermen, it is money out of their pockets, Thomson said.

The crab fleet took in $100 million last year by harvesting 4 million king crab. Trawlers discarded 300,000 king crab, most of them dead, worth about $7.5 million. That directly reduced the amount of king crab Alaska fishermen could catch, Thomson said.

"We still don't think there is enough protection for king crab," he said. "King crab stocks are still depressed in the Bering Sea."

The Alaska bottomfish industry boomed in the 1980s after the crash of the king crab population. Crabbers harvested 20 million king crab in 1980. But the crab fishery collapsed in following years, providing a harvest of only 540,000 crab in 1982 before closing completely in 1983. Scientists still cannot explain the reasons for the steep decline in the population.

Crabbers turned their efforts to bottom fish and began delivering their catch to a well-established fleet of foreign processors. With the Magnuson Act backing them, the American trawl fleet mushroomed and forced out the foreign fleet.

The Seattle-based trawl industry, with an efficient fleet of 60 factory trawlers and four monstrous factory ships, quickly overwhelmed the fishery.

Industry officials say intense competition prompted some fishermen to cut corners and aggressively fish without regard to bycatch and waste. Conscientious processors move out of an area if they discover a large percentage of a bycatch species in a haul, they say.

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THE DECLINE of halibut stocks in the North Pacific since 1988 often is blamed on the trawler industry. The Bering Sea is the North Pacific's nursery for halibut and the decline of those fish coincides with the increase in trawler pressure.

The trawl fleet is allowed to take and throw back 11.6 million pounds of halibut in the Bering this year as it pursues its legal species. At an average of 3½ pounds each for juvenile halibut, the figure represents more than 3 million fish.

While critics blame trawlers, International Pacific Halibut Commission biologists say they believe the decline is a natural fluctuation. A complex formula compensates for the halibut killed by the trawlers and reduces the annual quota given to longliners.

Trawlers are not to blame for the drop, but their halibut bycatch will hurt the longliners more each year as numbers continue to dwindle, said Bob Crumble, senior biologist with the halibut commission. The available harvest of halibut statewide by 1996 may be below 25 million pounds, a third of the peak in 1988, he said.

"It may be that quantities available over the next four to five years could be fairly painful for people," Crumble said.

"We believe this natural downturn we see now is going to continue for several more years. We don't know how far the decline will continue or when it will begin back up again."

Greg Seider, director of United Fishermen of Alaska, said he is not so sure trawlers are innocent in the halibut decline.

"None of it is going down real well," he said."It's really easy to say it's the trawlers, but prove it. That's the rub, because we really haven't seen the resources dedicated to really get a handle on it."

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CRITICS and defenders of the trawl fishery and the drawn-out regulatory process remain optimistic. Better technology, regulations and fishing methods, along with developing markets for fish now discarded could drastically reduce waste.

"I think we're still kind of new to the game and we're still trying to figure out a way to do it," said Bruce Buls, a spokesman for the American Factory Trawlers Association.

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"We're looking for some mechanism to get the dirty fisherman out of the fishery, temporarily if not permanently."

Cotter and Larkins agree on the long-term solution. Both said they want a system that rewards efficient trawlers while penalizing those with a large bycatch.

The current system penalizes the entire fleet. When the bycatch limit for any prohibited species is reached in a given region, the entire fleet must quit fishing in that area. The system proposed by Cotter and Larkins would force offending vessels to sit out all or part of the season while their competitors continued fishing.

"The way I envision it, the dirty vessels will not be able to survive and will go bankrupt," Cotter said. "Eventually, we will have a rational fishery, but I think it will take five years to get there and in the process there will be a lot of bankruptcies."

Larkins said he would like to take what he calls the "penalty box" concept one step further, tying the bottom fishery to the shore-based halibut and crab fishery. Each of those fisheries would be closed to further entries, under one industry-sponsored proposal. Those grandfathered in to the program would receive a certificate giving them a set percentage of each year's allocation.

A TRAWLER wanting to fish in halibut waters would have to buy a halibut allocation from longliners. The halibut would be processed and not thrown back, and the trawler would strive to make its halibut allocation last as long as possible by fishing the waters selectively.

"Once you get a certificate, if you want to expand your market, you go out and buy someone else's certificate," Larkins said. "This way the marketplace decides where the best benefit of these fisheries lies. You don't have to make political judgments.

"It's got to come down to where the individual fisherman has some kind of incentive to fish as cleanly as possible."

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THE PROBLEM is worldwide, although other countries have explored options for solving the problem. For example, New Zealand uses a trade-off program to reduce its high-seas waste problem.

Captains have the option of selling their bycatch to the government or paying to keep it, using a complex trade-off formula which takes into account the value and quotas of the target species, said Dr. Malcolm Haddon.

Haddon is a biologist with the Ministry of Agriculture and Fisheries in Auckland, a port on New Zealand's North Island. Trawler operators sort their catch and use separate freezers for different species, he said.

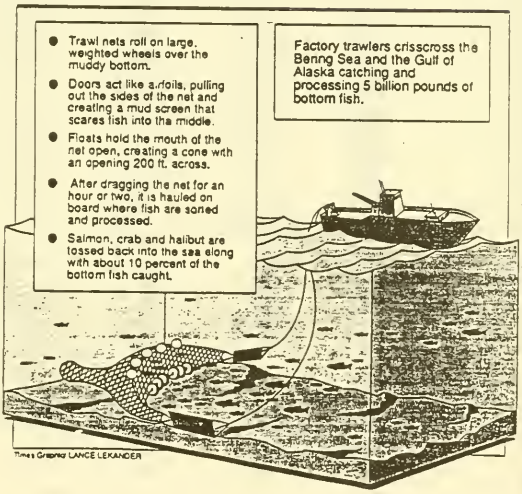
"The fishermen get a minimal price for bringing it in, but it encourages them to bring it in and not dump it," he said. The low price deters operators from targeting the bycatch species, he said. All transactions must be individually approved and the program is coordinated by computer.

"People monitor the bycatch trade to be certain that it's honest," he said. "It's not the answer to everybody's prayers, but it does avoid waste."

In New Zealand's peak season, 30 to 40 commercial boats fish offshore. Government observers are assigned to about half the boats to monitor the catch and stop operators from illegally transferring fish to another vessel.

Upton, of the Center for Marine Conservation in Washington, said he sees a hard fight ahead for the industry to find its balance in the Bering Sea fishery.

"In the Northeast, we fished the resource to hell," Upton said. "We haven't done that yet in Alaska, but the danger signals are there. I think we're going to solve these issues in time. Unfortunately, we're learning the hard way."



Times Graphic/ LANCE LEKANDER

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Bering Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	RSOL/OFLAT	AMCK	15	8	53.3	0.0
	RSOL/OFLAT	ARTH	2314	2309	99.8	3.4
	RSOL/OFLAT	FLOU	11876	5532	46.6	8.1
	RSOL/OFLAT	GTRB	196	178	90.8	0.3
	RSOL/OFLAT	OTHR	4110	3978	96.8	5.9
	RSOL/OFLAT	PCOD	9541	6340	66.5	9.3
	RSOL/OFLAT	PLCK	21087	19337	91.7	28.5
	RSOL/OFLAT	POP	112	105	93.8	0.2
	RSOL/OFLAT	ROCK	4	4	100.0	0.0
	RSOL/OFLAT	RSOL	41982	24068	57.3	35.4
	RSOL/OFLAT	SABL	13	9	69.2	0.0
	RSOL/OFLAT	SCNO	2	1	50.0	0.0
	RSOL/OFLAT	SQID	2	2	100.0	0.0
	RSOL/OFLAT	SRRE	2	1	50.0	0.0
	RSOL/OFLAT	YSOL	11937	6095	51.1	9.0
TOTAL			103193	67967	65.9	100.0
Trawl	ROCK	AMCK	2916	1215	41.7	16.9
	ROCK	ARTH	1263	1123	88.9	15.6
	ROCK	FLOU	252	140	55.6	2.0
	ROCK	GTRB	644	78	12.1	1.1
	ROCK	OTHR	684	567	82.9	7.9
	ROCK	PCOD	976	260	26.6	3.6
	ROCK	PLCK	1610	1463	90.9	20.4
	ROCK	POP	15067	1673	11.1	23.3
	ROCK	ROCK	130	60	46.2	0.8
	ROCK	RSOL	63	59	93.7	0.8
	ROCK	SABL	55	5	9.1	0.1
	ROCK	SCNO	805	288	35.8	4.0
	ROCK	SQID	27	27	100.0	0.4
	ROCK	SRRE	180	148	82.2	2.1
	ROCK	SRSN	356	71	19.9	1.0
TOTAL			25028	7177	28.7	100.0
Trawl	YSOL	ARTH	901	864	95.9	1.7
	YSOL	FLOU	8908	6549	73.5	12.8
	YSOL	GTRB	5	5	100.0	0.0
	YSOL	OTHR	3566	3509	98.4	6.8
	YSOL	PCOD	7686	4207	54.7	8.2
	YSOL	PLCK	14789	13435	90.8	26.2
	YSOL	POP	5	5	100.0	0.0
	YSOL	RSOL	7104	4319	60.8	8.4
	YSOL	YSOL	81129	18355	22.6	35.8
TOTAL			124093	51248	41.3	100.0

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Bering Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	AMCK	AMCK	58110	11617	20.0	63.0
	AMCK	ARTH	168	168	100.0	0.9
	AMCK	FLOU	5	4	80.0	0.0
	AMCK	GTRB	118	116	98.3	0.6
	AMCK	OTHR	309	309	100.0	1.7
	AMCK	PCOD	4091	1980	48.4	10.7
	AMCK	PLCK	141	104	73.8	0.6
	AMCK	POP	840	526	62.6	2.9
	AMCK	ROCK	66	43	65.2	0.2
	AMCK	RSOL	100	90	90.0	0.5
	AMCK	SABL	4	0	0.0	0.0
	AMCK	SCNO	3538	3487	98.6	18.9
	AMCK	SQID	1	1	100.0	0.0
	AMCK	SRRE	654	5	0.8	0.0
TOTAL			68145	18450	27.1	100.0
Trawl	PLCK-Bot	AMCK	2	2	100.0	0.0
	PLCK-Bot	ARTH	567	436	76.9	2.1
	PLCK-Bot	FLOU	1570	1081	68.9	5.3
	PLCK-Bot	GTRB	18	10	55.6	0.0
	PLCK-Bot	OTHR	1405	1231	87.6	6.0
	PLCK-Bot	PCOD	11997	4642	38.7	22.8
	PLCK-Bot	PLCK	85140	7091	8.3	34.8
	PLCK-Bot	POP	97	87	89.7	0.4
	PLCK-Bot	RSOL	6576	5355	81.4	26.3
	PLCK-Bot	SABL	1	0	0.0	0.0
	PLCK-Bot	SCNO	9	7	77.8	0.0
	PLCK-Bot	SQID	36	0	0.0	0.0
	PLCK-Bot	YSOL	530	416	78.5	2.0
TOTAL			107948	20358	18.9	100.0
Trawl	SABL	ARTH	13	13	100.0	23.6
	SABL	GTRB	20	20	100.0	36.4
	SABL	PLCK	15	15	100.0	27.3
	SABL	ROCK	1	1	100.0	1.8
	SABL	SABL	19	0	0.0	0.0
	SABL	SQID	5	5	100.0	9.1
	SABL	SRRE	1	1	100.0	1.8
TOTAL			74	55	74.3	100.0

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Bering Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	PLCK-Mid	AMCK	41	40	97.6	0.1
	PLCK-Mid	ARTH	519	461	88.8	0.9
	PLCK-Mid	FLOU	2449	2300	93.9	4.3
	PLCK-Mid	GTRB	64	64	100.0	0.1
	PLCK-Mid	OTHR	1593	1561	98.0	2.9
	PLCK-Mid	PCOD	8236	6675	81.0	12.6
	PLCK-Mid	PLCK	1188893	38713	3.3	72.8
	PLCK-Mid	POP	200	194	97.0	0.4
	PLCK-Mid	ROCK	3	3	100.0	0.0
	PLCK-Mid	RSOL	2153	2132	99.0	4.0
	PLCK-Mid	SCNO	20	20	100.0	0.0
	PLCK-Mid	SQID	552	485	87.9	0.9
	PLCK-Mid	SRRE	2	2	100.0	0.0
	PLCK-Mid	SRSN	2	2	100.0	0.0
	PLCK-Mid	YSOL	523	500	95.6	0.9
TOTAL			1205250	53152	4.4	100.0
Trawl	PCOD	AMCK	3140	2760	87.9	5.4
	PCOD	ARTH	1752	1671	95.4	3.3
	PCOD	FLOU	2681	2520	94.0	5.0
	PCOD	GTRB	63	41	65.1	0.1
	PCOD	OTHR	2926	2746	93.8	5.4
	PCOD	PCOD	54775	7006	12.8	13.8
	PCOD	PLCK	29733	27294	91.8	53.7
	PCOD	POP	742	447	60.2	0.9
	PCOD	ROCK	26	24	92.3	0.0
	PCOD	RSOL	5735	5171	90.2	10.2
	PCOD	SABL	3	0	0.0	0.0
	PCOD	SCNO	360	265	73.6	0.5
	PCOD	SQID	4	3	75.0	0.0
	PCOD	SRRE	9	9	100.0	0.0
	PCOD	SRSN	17	17	100.0	0.0
	PCOD	YSOL	840	837	99.6	1.6
TOTAL			102806	50811	49.4	100.0

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Gulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	ROCK	AMCK	84	38	45.2	0.6
	ROCK	ARTH	1673	1536	91.8	25.7
	ROCK	DEMS	173	21	12.1	0.4
	ROCK	DFLT	196	138	70.4	2.3
	ROCK	FSOL	24	17	70.8	0.3
	ROCK	NORK	4289	805	18.8	13.5
	ROCK	OTHR	307	203	66.1	3.4
	ROCK	PCOD	288	195	67.7	3.3
	ROCK	PELS	2518	107	4.2	1.8
	ROCK	PLCK	130	130	100.0	2.2
	ROCK	POP	1245	985	79.1	16.5
	ROCK	SABL	1037	50	4.8	0.8
	ROCK	SFLT	15	11	73.3	0.2
	ROCK	SLPR	2961	1632	55.1	27.3
	ROCK	SRRE	766	73	9.5	1.2
	ROCK	THDS	238	40	16.8	0.7
TOTAL			15944	5981	37.5	100.0
Trawl	OTHR	AMCK	1718	87	5.1	2.6
	OTHR	ARTH	662	657	99.2	19.3
	OTHR	DEMS	66	61	92.4	1.8
	OTHR	DFLT	140	61	43.6	1.8
	OTHR	FSOL	312	53	17.0	1.6
	OTHR	NORK	464	412	88.8	12.1
	OTHR	OTHR	5146	397	7.7	11.6
	OTHR	PCOD	546	339	62.1	9.9
	OTHR	PELS	370	290	78.4	8.5
	OTHR	PLCK	64	61	95.3	1.8
	OTHR	POP	325	282	86.8	8.3
	OTHR	SABL	121	9	7.4	0.3
	OTHR	SFLT	60	41	68.3	1.2
	OTHR	SLPR	1644	598	36.4	17.5
	OTHR	SRRE	43	12	27.9	0.4
	OTHR	THDS	72	49	68.1	1.4
TOTAL			11753	3409	29.0	100.0

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Gulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	DFLT	ARTH	7095	7012	98.8	70.9
	DFLT	DEMS	9	4	44.4	0.0
	DFLT	DFLT	4521	546	12.1	5.5
	DFLT	FSOL	895	350	39.1	3.5
	DFLT	NORK	2	1	50.0	0.0
	DFLT	OTHR	545	536	98.3	5.4
	DFLT	PCOD	1104	491	44.5	5.0
	DFLT	PELS	17	12	70.6	0.1
	DFLT	PLCK	298	284	95.3	2.9
	DFLT	POP	222	112	50.5	1.1
	DFLT	SABL	698	236	33.8	2.4
	DFLT	SFLT	386	88	22.8	0.9
	DFLT	SLPR	167	163	97.6	1.6
	DFLT	SRRE	219	22	10.0	0.2
	DFLT	THDS	200	30	15.0	0.3
TOTAL			16378	9887	60.4	100.0
Trawl	SFLT	AMCK	4	4	100.0	0.1
	SFLT	ARTH	2501	2385	95.4	37.9
	SFLT	DEMS	1	1	100.0	0.0
	SFLT	DFLT	634	135	21.3	2.1
	SFLT	FSOL	858	214	24.9	3.4
	SFLT	NORK	15	5	33.3	0.1
	SFLT	OTHR	708	704	99.4	11.2
	SFLT	PCOD	1775	868	48.9	13.8
	SFLT	PELS	21	14	66.7	0.2
	SFLT	PLCK	578	386	66.8	6.1
	SFLT	POP	35	33	94.3	0.5
	SFLT	SABL	160	47	29.4	0.7
	SFLT	SFLT	5240	1355	25.9	21.5
	SFLT	SLPR	7	7	100.0	0.1
	SFLT	SRRE	109	97	89.0	1.5
	SFLT	THDS	73	35	47.9	0.6
TOTAL			12719	6290	49.5	100.0

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Gulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	PLCK-Bot	ARTH	573	573	100.0	11.2
	PLCK-Bot	DFLT	347	102	29.4	2.0
	PLCK-Bot	FSOL	347	87	25.1	1.7
	PLCK-Bot	NORK	1	0	0.0	0.0
	PLCK-Bot	OTHR	549	548	99.8	10.7
	PLCK-Bot	PCOD	2446	1225	50.1	24.0
	PLCK-Bot	PLCK	18533	1741	9.4	34.1
	PLCK-Bot	POP	17	8	47.1	0.2
	PLCK-Bot	RSOL	546	546	100.0	10.7
	PLCK-Bot	SABL	107	9	8.4	0.2
	PLCK-Bot	SFLT	935	259	27.7	5.1
	PLCK-Bot	SLPR	2	2	100.0	0.0
	PLCK-Bot	SRRE	17	2	11.8	0.0
	PLCK-Bot	THDS	11	4	36.4	0.1
TOTAL			24431	5106	20.9	100.0
Trawl	PCOD	ARTH	2167	2166	100.0	34.8
	PCOD	DEMS	5	5	100.0	0.1
	PCOD	DFLT	126	34	27.0	0.5
	PCOD	FSOL	221	130	58.8	2.1
	PCOD	NORK	6	3	50.0	0.0
	PCOD	OTHR	453	450	99.3	7.2
	PCOD	PCOD	30709	1388	4.5	22.3
	PCOD	PELS	57	54	94.7	0.9
	PCOD	PLCK	2253	963	42.7	15.5
	PCOD	POP	26	23	88.5	0.4
	PCOD	SABL	64	20	31.3	0.3
	PCOD	SFLT	1202	700	58.2	11.2
	PCOD	SLPR	280	279	99.6	4.5
	PCOD	SRRE	12	4	33.3	0.1
	PCOD	THDS	15	6	40.0	0.1
TOTAL			37596	6225	16.6	100.0

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Gulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	PLCK-Mid	AMCK	2	2	100.0	0.0
	PLCK-Mid	ARTH	285	256	89.8	4.9
	PLCK-Mid	DFLT	5	2	40.0	0.0
	PLCK-Mid	FSOL	16	14	87.5	0.3
	PLCK-Mid	NORK	7	0	0.0	0.0
	PLCK-Mid	OTHR	346	342	98.8	6.6
	PLCK-Mid	PCOD	499	308	61.7	5.9
	PLCK-Mid	PELS	2	2	100.0	0.0
	PLCK-Mid	PLCK	86215	4246	4.9	81.3
	PLCK-Mid	POP	1	0	0.0	0.0
	PLCK-Mid	SABL	16	1	6.3	0.0
	PLCK-Mid	SFLT	103	38	36.9	0.7
	PLCK-Mid	SRRE	10	9	90.0	0.2
	PLCK-Mid	THDS	1	0	0.0	0.0
TOTAL			87508	5220	6.0	100.0
Trawl	ARTH	ARTH	1717	691	40.2	68.7
	ARTH	DEMS	2	1	50.0	0.1
	ARTH	DFLT	97	33	34.0	3.3
	ARTH	FSOL	55	28	50.9	2.8
	ARTH	NORK	1	1	100.0	0.1
	ARTH	OTHR	73	68	93.2	6.8
	ARTH	PCOD	114	20	17.5	2.0
	ARTH	PELS	24	5	20.8	0.5
	ARTH	PLCK	39	37	94.9	3.7
	ARTH	POP	56	41	73.2	4.1
	ARTH	SABL	90	20	22.2	2.0
	ARTH	SFLT	6	1	16.7	0.1
	ARTH	SLPR	24	22	91.7	2.2
	ARTH	SRRE	70	34	48.6	3.4
	ARTH	THDS	25	4	16.0	0.4
TOTAL			2393	1006	42.0	100.0

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Bering Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Hook and Line	PCOD	AMCK	21	17	81.0	0.1
	PCOD	ARTH	747	661	88.5	4.7
	PCOD	FLOU	206	197	95.6	1.4
	PCOD	GTRB	203	65	32.0	0.5
	PCOD	OTHR	8079	7037	87.1	49.7
	PCOD	PCOD	65609	4145	6.3	29.3
	PCOD	PLCK	2063	1809	87.7	12.8
	PCOD	POP	7	5	71.4	0.0
	PCOD	ROCK	51	34	66.7	0.2
	PCOD	RSOL	19	18	94.7	0.1
	PCOD	SABL	74	12	16.2	0.1
	PCOD	SCNO	21	18	85.7	0.1
	PCOD	SRRE	196	140	71.4	1.0
	PCOD	SRSN	10	3	30.0	0.0
	PCOD	YSOL	5	5	100.0	0.0
TOTAL			77311	14166	18.3	100.0
Hook and Line	ROCK	ARTH	13	13	100.0	20.0
	ROCK	GTRB	14	8	57.1	12.3
	ROCK	OTHR	6	6	100.0	9.2
	ROCK	PCOD	19	14	73.7	21.5
	ROCK	PLCK	1	1	100.0	1.5
	ROCK	POP	1	1	100.0	1.5
	ROCK	ROCK	49	8	16.3	12.3
	ROCK	SABL	22	2	9.1	3.1
	ROCK	SCNO	1	1	100.0	1.5
	ROCK	SRRE	25	11	44.0	16.9
	ROCK	SRSN	4	0	0.0	0.0
TOTAL			155	65	41.9	100.0
Hook and Line	SABL	ARTH	172	170	98.8	13.1
	SABL	FLOU	1	1	100.0	0.1
	SABL	GTRB	1035	800	77.3	61.6
	SABL	OTHR	183	179	97.8	13.8
	SABL	PCOD	32	15	46.9	1.2
	SABL	POP	2	2	100.0	0.2
	SABL	ROCK	268	25	9.3	1.9
	SABL	SABL	1903	22	1.2	1.7
	SABL	SCNO	4	0	0.0	0.0
	SABL	SRRE	101	83	82.2	6.4
	SABL	SRSN	1	1	100.0	0.1
	SABL	THDS	1	1	100.0	0.1
TOTAL			3703	1299	35.1	100.0

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Bering Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Hook and Line	GTRB	ARTH	555	469	84.5	31.9
	GTRB	FLOU	102	100	98.0	6.8
	GTRB	GTRB	5995	326	5.4	22.1
	GTRB	OTHR	530	493	93.0	33.5
	GTRB	PCOD	113	27	23.9	1.8
	GTRB	PLCK	5	1	20.0	0.1
	GTRB	POP	1	0	0.0	0.0
	GTRB	ROCK	76	3	3.9	0.2
	GTRB	SABL	573	10	1.7	0.7
	GTRB	SRRE	100	42	42.0	2.9
	GTRB	SRSN	97	1	1.0	0.1
TOTAL			8147	1472	18.1	100.0

1993 Groundfish Discards by Gear and Target Species

* From Blended Data Through 11/13/93

Gulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Hook and Line	PCOD	ARTH	144	144	100.0	14.0
	PCOD	DEMS	34	3	8.8	0.3
	PCOD	OTHR	648	646	99.7	62.9
	PCOD	PCOD	8188	204	2.5	19.9
	PCOD	PELS	3	0	0.0	0.0
	PCOD	PLCK	27	24	88.9	2.3
	PCOD	SABL	29	4	13.8	0.4
	PCOD	SFLT	1	1	100.0	0.1
	PCOD	SLPR	3	0	0.0	0.0
	PCOD	SRRE	11	1	9.1	0.1
	PCOD	THDS	3	0	0.0	0.0
TOTAL			9091	1027	11.3	100.0
Hook and Line	ROCK	ARTH	2	2	100.0	5.0
	ROCK	DEMS	538	8	1.5	20.0
	ROCK	OTHR	13	12	92.3	30.0
	ROCK	PCOD	37	5	13.5	12.5
	ROCK	PELS	65	0	0.0	0.0
	ROCK	POP	1	0	0.0	0.0
	ROCK	SABL	39	13	33.3	32.5
	ROCK	SFLT	2	0	0.0	0.0
	ROCK	SLPR	6	0	0.0	0.0
	ROCK	SRRE	34	0	0.0	0.0
	ROCK	THDS	5	0	0.0	0.0
TOTAL			742	40	5.4	100.0
Hook and Line	SABL	ARTH	1726	1693	98.1	31.5
	SABL	DEMS	90	18	20.0	0.3
	SABL	DFLT	53	50	94.3	0.9
	SABL	FSOL	1	0	0.0	0.0
	SABL	GTRB	1036	1036	100.0	19.3
	SABL	NORK	5	0	0.0	0.0
	SABL	OTHR	1113	1095	98.4	20.4
	SABL	PCOD	667	484	72.6	9.0
	SABL	PELS	8	0	0.0	0.0
	SABL	PLCK	2	2	100.0	0.0
	SABL	POP	2	0	0.0	0.0
	SABL	ROCK	83	83	100.0	1.5
	SABL	SABL	22001	358	1.6	6.7
	SABL	SFLT	3	3	100.0	0.1
	SABL	SLPR	5	5	100.0	0.1
	SABL	SRRE	594	243	40.9	4.5
	SABL	THDS	688	305	44.3	5.7
TOTAL			28077	5375	19.1	100.0

1993 Groundfish Discards by Gear and Target Species

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Bering Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Jig	PCOD	PCOD	35	0	0.0	0.0
TOTAL			35	0	0.0	0
Pot	PCOD	AMCK	3	3	100.0	3.7
	PCOD	OTHR	46	44	95.7	54.3
	PCOD	PCOD	2098	25	1.2	30.9
	PCOD	PLCK	2	2	100.0	2.5
	PCOD	YSOL	7	7	100.0	8.6
TOTAL			2156	81	3.8	100.0

1993 Groundfish Discards by Gear and Target Species

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Gulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH	TOTAL DISCARD	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Jig	PCOD	DEMS	1	0	0.0	0.0
	PCOD	PCOD	5	0	0.0	0.0
	PCOD	PELS	1	0	0.0	0.0
	PCOD	SLPR	1	0	0.0	0.0
TOTAL			8	0	0.0	0.0
Jig	ROCK	DEMS	11	1	9.1	100.0
	ROCK	PCOD	2	0	0.0	0.0
	ROCK	PELS	101	0	0.0	0.0
	ROCK	SLPR	1	0	0.0	0.0
TOTAL			115	1	0.9	100.0
Pot	PCOD	ARTH	3	3	100.0	1.3
	PCOD	OTHR	196	124	63.3	54.6
	PCOD	PCOD	9708	81	0.8	35.7
	PCOD	PLCK	14	14	100.0	6.2
	PCOD	SFLT	5	5	100.0	2.2
TOTAL			9926	227	2.3	100.0

Code Table

TARGET CODE	Species or Species Group
AMCK	Atka Mackerel
ARTH	Arrowtooth Flounder
RSOL/OFLAT	Rock Sole & Other Flatfish
GTRB	Greenland Turbot
ROCK	Rockfish
PCOD	Pacific Cod
PLCK-Mid	Midwater Pollock
PLCK-Bot	Bottom Pollock
SABL	Sablefish
YSOL	Yellowfin Sole
DFLT	Deepwater Flatfish
SFLT	Shallowwater Flatfish
OTHR	Other Species

SPECIES CODE	Species or Species Group
AMCK	Atka Mackerel
ARTH	Arrowtooth Flounder
DEMS	Demersal Shelf Rockfish
FLOU	Other Flatfish
FSOL	Flathead Sole
GTRB	Greenland Turbot
NORK	Northern Rockfish
OTHR	Other Species
PCOD	Pacific Cod
PELS	Pelagic Shelf Rockfish
PLCK	Pollock
POP	Pacific Ocean Perch
ROCK	Other Rockfish
RSOL	Rock Sole
SABL	Sablefish
SCNO	Sharpchin & Northern Rockfish
SLPR	Slope Rockfish
SQID	Squid
SRRE	Shortraker & Rougheye Rockfish
SRSN	Shortraker, Rougheye, Sharpchin, & Northern Rockfish
THDS	Thornyheads
YSOL	Yellowfin Sole

1992 Groundfish Discards by Gear and Target Species

AGENDA D-2(b)(1)
JANUARY 1994

* From Blended Data

Bering Sea and Aleutian Islands

AR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Hook and Line	PCOD	AMCK	57	31	54.4	0.17
	PCOD	ARTH	1671	1611	96.4	8.79
	PCOD	FLOU	279	261	93.5	1.42
	PCOD	GTRB	577	460	79.7	2.51
	PCOD	OTHR	11259	10459	92.9	57.04
	PCOD	PCOD	101710	1866	1.8	10.18
	PCOD	PLCK	3222	3116	96.7	16.99
	PCOD	POP	114	98	86.0	0.53
	PCOD	ROCK	199	46	23.1	0.25
	PCOD	RSOL	28	25	89.3	0.14
	PCOD	SABL	179	20	11.2	0.11
	PCOD	SCNO	45	39	86.7	0.21
	PCOD	SRRE	462	215	46.5	1.17
	PCOD	YSOL	91	90	98.9	0.49
TOTAL			119893	18337	15.3	100.00
Hook and Line	SABL	ARTH	268	265	98.9	14.20
	SABL	FLOU	1	1	100.0	0.05
	SABL	GTRB	1445	1256	86.9	67.31
	SABL	OTHR	146	144	98.6	7.72
	SABL	PCOD	139	100	71.9	5.36
	SABL	PLCK	1	1	100.0	0.05
	SABL	ROCK	225	30	13.3	1.61
	SABL	SABL	1807	19	1.1	1.02
	SABL	SCNO	3	2	66.7	0.11
	SABL	SRRE	30	24	80.0	1.29
	SABL	SRSN	16	9	56.3	0.48
	SABL	THDS	30	15	50.0	0.80
TOTAL			4111	1866	45.4	100.00
Hook and Line	GTRB	ARTH	4	4	100.0	14.29
	GTRB	GTRB	75	13	17.3	46.43
	GTRB	OTHR	10	10	100.0	35.71
	GTRB	PCOD	12	0	0.0	0.00
	GTRB	ROCK	2	0	0.0	0.00
	GTRB	SABL	28	0	0.0	0.00
	GTRB	SRRE	2	1	50.0	3.57
TOTAL			133	28	21.1	100.00

1992 Groundfish Discards by Gear and Target Species

* From Blended Data

Bering Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Pot	PCOD	AMCK	12	12	100.0	1.59
	PCOD	ARTH	3	3	100.0	0.40
	PCOD	FLOU	1	1	100.0	0.13
	PCOD	GTRB	9	9	100.0	1.19
	PCOD	OTHR	670	591	88.2	78.28
	PCOD	PCOD	13680	103	0.8	13.64
	PCOD	PLCK	7	7	100.0	0.93
	PCOD	ROCK	2	2	100.0	0.26
	PCOD	RSOL	2	2	100.0	0.26
	PCOD	SABL	13	0	0.0	0.00
	PCOD	SCNO	1	1	100.0	0.13
	PCOD	YSOL	24	24	100.0	3.18
TOTAL			14424	755	5.2	100.00

1992 Groundfish Discards by Gear and Target Species

* From Blended Data

Gulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Jig	PCOD	PCOD	154	0	0.0	0.00
	PCOD	PELS	3	0	0.0	0.00
TOTAL			157	0	0.0	0.00
Pot	PCOD	ARTH	1	1	100.0	0.39
	PCOD	OTHR	174	98	56.3	37.84
	PCOD	PCOD	9984	158	1.6	61.00
	PCOD	PLCK	2	1	50.0	0.39
	PCOD	SFLT	1	1	100.0	0.39
	PCOD	SRRE	1	0	0.0	0.00
TOTAL			10163	259	2.5	100.00

1992 Groundfish Discards by Gear and Target Species

* From Blended Data

ulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Hook and Line	PCOD	AMCK	1	1	100.0	0.08
	PCOD	ARTH	209	208	99.5	17.35
	PCOD	DEMS	49	3	6.1	0.25
	PCOD	DFLT	3	1	33.3	0.08
	PCOD	FSOL	3	3	100.0	0.25
	PCOD	GTRB	13	13	100.0	1.08
	PCOD	OTHR	618	610	98.7	50.88
	PCOD	PCOD	14891	194	1.3	16.18
	PCOD	PELS	17	4	23.5	0.33
	PCOD	PLCK	60	51	85.0	4.25
	PCOD	ROCK	1	1	100.0	0.08
	PCOD	SABL	138	81	58.7	6.76
	PCOD	SFLT	10	10	100.0	0.83
	PCOD	SLPR	7	0	0.0	0.00
	PCOD	SRRE	20	14	70.0	1.17
	PCOD	THDS	24	5	20.8	0.42
TOTAL			16064	1199	7.5	100.00
Hook and Line	ROCK	ARTH	3	3	100.0	16.67
	ROCK	DEMS	516	0	0.0	0.00
	ROCK	OTHR	4	2	50.0	11.11
	ROCK	PCOD	56	2	3.6	11.11
	ROCK	PELS	106	0	0.0	0.00
	ROCK	SABL	44	10	22.7	55.56
	ROCK	SLPR	10	0	0.0	0.00
	ROCK	SRRE	98	1	1.0	5.56
	ROCK	THDS	9	0	0.0	0.00
TOTAL			846	18	2.1	100.00
Hook and Line	SABL	ARTH	1266	1259	99.4	19.23
	SABL	DEMS	213	6	2.8	0.09
	SABL	DFLT	61	41	67.2	0.63
	SABL	FSOL	3	3	100.0	0.05
	SABL	GTRB	3176	3176	100.0	48.51
	SABL	OTHR	815	813	99.8	12.42
	SABL	PCOD	510	335	65.7	5.12
	SABL	PELS	45	0	0.0	0.00
	SABL	PLCK	13	13	100.0	0.20
	SABL	POP	6	0	0.0	0.00
	SABL	ROCK	11	2	18.2	0.03
	SABL	SABL	20477	287	1.4	4.38
	SABL	SFLT	1	1	100.0	0.02
	SABL	SLPR	57	0	0.0	0.00
	SABL	SRRE	545	286	52.5	4.37
	SABL	THDS	830	325	39.2	4.96
TOTAL			28029	6547	23.4	100.00

1992 Groundfish Discards by Gear and Target Species

* From Blended Data

Bering Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	PLCK-Mid	AMCK	242	219	90.5	0.21
	PLCK-Mid	ARTH	2798	2635	94.2	2.52
	PLCK-Mid	FLOU	5627	5065	90.0	4.85
	PLCK-Mid	FSOL	1	1	100.0	0.00
	PLCK-Mid	GTRB	251	187	74.5	0.18
	PLCK-Mid	OTHR	3361	3190	94.9	3.05
	PLCK-Mid	PCOD	13492	8658	64.2	8.28
	PLCK-Mid	PLCK	1295473	80653	6.2	77.15
	PLCK-Mid	POP	165	145	87.9	0.14
	PLCK-Mid	ROCK	20	17	85.0	0.02
	PLCK-Mid	RSOL	3268	3061	93.7	2.93
	PLCK-Mid	SABL	8	4	50.0	0.00
	PLCK-Mid	SCNO	9	8	88.9	0.01
	PLCK-Mid	SQID	798	505	63.3	0.48
	PLCK-Mid	SRRE	9	9	100.0	0.01
	PLCK-Mid	SRSN	2	1	50.0	0.00
	PLCK-Mid	YSOL	186	176	94.6	0.17
TOTAL			1325710	104534	7.9	100.00

1992 Groundfish Discards by Gear and Target Species

* From Blended Data

ring Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	AMCK	AMCK	43844	6375	14.5	63.99
	AMCK	ARTH	205	196	95.6	1.97
	AMCK	FLOU	39	29	74.4	0.29
	AMCK	GTRB	34	11	32.4	0.11
	AMCK	OTHR	191	191	100.0	1.92
	AMCK	PCOD	3390	861	25.4	8.64
	AMCK	PLCK	566	299	52.8	3.00
	AMCK	POP	1923	808	42.0	8.11
	AMCK	ROCK	141	107	75.9	1.07
	AMCK	RSOL	44	33	75.0	0.33
	AMCK	SABL	5	0	0.0	0.00
	AMCK	SCNO	1143	1017	89.0	10.21
	AMCK	SQID	2	2	100.0	0.02
	AMCK	SRRE	194	30	15.5	0.30
	AMCK	SRSN	4	3	75.0	0.03
TOTAL			51725	9962	19.3	100.00
Trawl	PLCK-Bot	AMCK	19	2	10.5	0.01
	PLCK-Bot	ARTH	1275	1002	78.6	5.16
	PLCK-Bot	FLOU	2959	2445	82.6	12.58
	PLCK-Bot	FSOL	9	9	100.0	0.05
	PLCK-Bot	GTRB	57	44	77.2	0.23
	PLCK-Bot	OTHR	1709	1432	83.8	7.37
	PLCK-Bot	PCOD	9693	1409	14.5	7.25
	PLCK-Bot	PLCK	96582	10139	10.5	52.19
	PLCK-Bot	POP	8	5	62.5	0.03
	PLCK-Bot	ROCK	393	3	0.8	0.02
	PLCK-Bot	RSOL	3715	2424	65.2	12.48
	PLCK-Bot	SCNO	11	1	9.1	0.01
	PLCK-Bot	SQID	52	8	15.4	0.04
	PLCK-Bot	YSOL	653	505	77.3	2.60
TOTAL			117135	19428	16.6	100.00
Trawl	YSOL	AMCK	1	1	100.0	0.00
	YSOL	ARTH	437	418	95.7	0.48
	YSOL	FLOU	17115	14311	83.6	16.57
	YSOL	GTRB	1	1	100.0	0.00
	YSOL	OTHR	7924	7640	96.4	8.85
	YSOL	PCOD	8539	4650	54.5	5.38
	YSOL	PLCK	12804	11053	86.3	12.80
	YSOL	RSOL	14462	9964	68.9	11.54
	YSOL	YSOL	138009	38314	27.8	44.37
TAL			199292	86352	43.3	100.00

1992 Groundfish Discards by Gear and Target Species

* From Blended Data

Bering Sea and Aleutian Islands

GEAR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	PCOD	AMCK	3071	2168	70.6	7.09
	PCOD	ARTH	2865	2724	95.1	8.91
	PCOD	FLOU	2379	2045	86.0	6.69
	PCOD	FSOL	17	17	100.0	0.06
	PCOD	GTRB	81	67	82.7	0.22
	PCOD	OTHR	2989	2865	95.9	9.37
	PCOD	PCOD	47913	3343	7.0	10.94
	PCOD	PLCK	16617	13936	83.9	45.59
	PCOD	POP	616	288	46.8	0.94
	PCOD	ROCK	79	76	96.2	0.25
	PCOD	RSOL	3501	2381	68.0	7.79
	PCOD	SABL	10	1	10.0	0.00
	PCOD	SCNO	376	323	85.9	1.06
	PCOD	SQID	13	13	100.0	0.04
	PCOD	SRRE	30	5	16.7	0.02
	PCOD	SRSN	55	45	81.8	0.15
	PCOD	YSOL	276	274	99.3	0 90
TOTAL			80888	30571	37.8	100.00
Trawl	RSOL/OFLAT	AMCK	10	3	30.0	0.01
	RSOL/OFLAT	ARTH	770	768	99.7	2.06
	RSOL/OFLAT	FLOU	6067	4277	70.5	11.47
	RSOL/OFLAT	GTRB	4	0	0.0	0.00
	RSOL/OFLAT	OTHR	3531	3484	98.7	9.34
	RSOL/OFLAT	PCOD	5766	2472	42.9	6.63
	RSOL/OFLAT	PLCK	11346	10173	89.7	27.29
	RSOL/OFLAT	POP	22	22	100.0	0.06
	RSOL/OFLAT	RSOL	26843	12686	47.3	34.03
	RSOL/OFLAT	YSOL	7539	3398	45.1	9.11
TOTAL			61898	37283	60.2	100.00
Trawl	ROCK	AMCK	2164	806	37.2	14.01
	ROCK	ARTH	1556	1543	99.2	26.82
	ROCK	FLOU	243	122	50.2	2.12
	ROCK	GTRB	220	33	15.0	0.57
	ROCK	OTHR	537	530	98.7	9.21
	ROCK	PCOD	1241	330	26.6	5.74
	ROCK	PLCK	1338	1239	92.6	21.53
	ROCK	POP	10708	743	6.9	12.91
	ROCK	ROCK	133	104	78.2	1.81
	ROCK	RSOL	61	40	65.6	0.70
	ROCK	SABL	25	2	8.0	0.03
	ROCK	SCNO	273	156	57.1	2.71
	ROCK	SQID	14	14	100.0	0.24
	ROCK	SRRE	766	66	8.6	1.15
	ROCK	SRSN	65	26	40.0	0.45
TOTAL			19344	5754	29.7	100.00

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1992 Groundfish Discards by Gear and Target Species

* From Blended Data

Gulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	PLCK-Bot	ARTH	692	681	98.4	24.18
	PLCK-Bot	DEMS	2	2	100.0	0.07
	PLCK-Bot	DFLT	255	39	15.3	1.38
	PLCK-Bot	FLOU	1	1	100.0	0.04
	PLCK-Bot	FSOL	185	43	23.2	1.53
	PLCK-Bot	GTRB	1	1	100.0	0.04
	PLCK-Bot	OTHR	150	146	97.3	5.18
	PLCK-Bot	PCOD	791	69	8.7	2.45
	PLCK-Bot	PELS	8	2	25.0	0.07
	PLCK-Bot	PLCK	20843	1629	7.8	57.85
	PLCK-Bot	POP	102	97	95.1	3.44
	PLCK-Bot	ROCK	1	1	100.0	0.04
	PLCK-Bot	SABL	66	10	15.2	0.36
	PLCK-Bot	SFLT	308	86	27.9	3.05
	PLCK-Bot	SLPR	8	5	62.5	0.18
	PLCK-Bot	SQID	3	1	33.3	0.04
	PLCK-Bot	SRRE	9	2	22.2	0.07
	PLCK-Bot	THDS	12	1	8.3	0.04
TOTAL			23437	2816	12.0	100.00
Trawl	PCOD	AMCK	3	1	33.3	0.01
	PCOD	ARTH	2303	2276	98.8	15.29
	PCOD	DEMS	12	9	75.0	0.06
	PCOD	DFLT	412	60	14.6	0.40
	PCOD	FLOU	507	507	100.0	3.41
	PCOD	FSOL	470	201	42.8	1.35
	PCOD	OTHR	1281	1279	99.8	8.59
	PCOD	PCOD	49458	1624	3.3	10.91
	PCOD	PELS	121	50	41.3	0.34
	PCOD	PLCK	7921	6836	86.3	45.93
	PCOD	POP	32	26	81.3	0.17
	PCOD	RSOL	491	491	100.0	3.30
	PCOD	SABL	74	21	28.4	0.14
	PCOD	SCNO	5	5	100.0	0.03
	PCOD	SFLT	2858	1383	48.4	9.29
	PCOD	SLPR	167	113	67.7	0.76
	PCOD	SRRE	45	1	2.2	0.01
	PCOD	THDS	19	2	10.5	0.01
TOTAL			66179	14885	22.5	100.00

1992 Groundfish Discards by Gear and Target Species

* From Blended Data

Gulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	ROCK	AMCK	115	64	55.7	0.72
	ROCK	ARTH	4176	3937	94.3	44.04
	ROCK	DEMS	101	22	21.8	0.25
	ROCK	DFLT	418	237	56.7	2.65
	ROCK	FSOL	68	22	32.4	0.25
	ROCK	OTHR	387	295	76.2	3.30
	ROCK	PCOD	580	182	31.4	2.04
	ROCK	PELS	2887	145	5.0	1.62
	ROCK	PLCK	545	406	74.5	4.54
	ROCK	POP	5241	957	18.3	10.71
	ROCK	SABL	1717	370	21.5	4.14
	ROCK	SFLT	64	30	46.9	0.34
	ROCK	SLPR	8335	2084	25.0	23.31
	ROCK	SQID	6	6	100.0	0.07
	ROCK	SRRE	1480	141	9.5	1.58
	ROCK	THDS	736	41	5.6	0.46
TOTAL			26856	8939	33.3	100.00
	OTHR	DFLT	296	228	77.0	1.13
	OTHR	FSOL	182	8	4.4	0.04
	OTHR	OTHR	5029	392	7.8	1.94
	OTHR	PCOD	971	544	56.0	2.69
	OTHR	PELS	65	31	47.7	0.15
	OTHR	PLCK	229	184	80.3	0.91
	OTHR	POP	640	328	51.3	1.62
	OTHR	SABL	36	13	36.1	0.06
	OTHR	SFLT	57	22	38.6	0.11
	OTHR	SLPR	729	614	84.2	3.03
	OTHR	SRRE	45	7	15.6	0.03
	OTHR	THDS	19	6	31.6	0.03
TOTAL			62010	20255	32.7	100.00
Trawl	PLCK-Mid	ARTH	300	288	96.0	5.02
	PLCK-Mid	DFLT	13	12	92.3	0.21
	PLCK-Mid	FLOU	13	13	100.0	0.23
	PLCK-Mid	FSOL	23	20	87.0	0.35
	PLCK-Mid	GTRB	1	1	100.0	0.02
	PLCK-Mid	OTHR	330	326	98.8	5.69
	PLCK-Mid	PCOD	238	54	22.7	0.94
	PLCK-Mid	PELS	4	4	100.0	0.07
	PLCK-Mid	PLCK	61646	4940	8.0	86.18
	PLCK-Mid	POP	8	1	12.5	0.02
	PLCK-Mid	ROCK	1	1	100.0	0.02
	PLCK-Mid	SABL	11	0	0.0	0.00
	PLCK-Mid	SFLT	63	61	96.8	1.06
	PLCK-Mid	SLPR	1	1	100.0	0.02
	PLCK-Mid	SQID	16	9	56.3	0.16
	PLCK-Mid	SRRE	1	1	100.0	0.02
TOTAL			62669	5732	9.1	100.00

1992 Groundfish Discards by Gear and Target Species

* From Blended Data

Gulf of Alaska

GEAR	TARGET	SPECIES	TOTAL CATCH (MT)	TOTAL DISCARD (MT)	PERCENTAGE DISCARDED	PERCENTAGE OF TOTAL DISCARD
Trawl	DFLT	AMCK	2	0	0.0	0.00
	DFLT	ARTH	9378	9279	98.9	72.08
	DFLT	DEMS	8	1	12.5	0.01
	DFLT	DFLT	6413	742	11.6	5.76
	DFLT	FSOL	784	169	21.6	1.31
	DFLT	OTHR	672	669	99.6	5.20
	DFLT	PCOD	1113	237	21.3	1.84
	DFLT	PELS	55	24	43.6	0.19
	DFLT	PLCK	1404	1086	77.4	8.44
	DFLT	POP	313	281	89.8	2.18
	DFLT	SABL	619	127	20.5	0.99
	DFLT	SFLT	485	84	17.3	0.65
	DFLT	SLPR	169	90	53.3	0.70
	DFLT	SRRE	130	22	16.9	0.17
	DFLT	THDS	326	63	19.3	0.49
TOTAL			21871	12874	58.9	100.00
Trawl	SFLT	ARTH	1660	1660	100.0	46.23
	SFLT	DEMS	2	1	50.0	0.03
	SFLT	DFLT	476	163	34.2	4.54
	SFLT	FSOL	469	24	5.1	0.67
	SFLT	OTHR	574	571	99.5	15.90
	SFLT	PCOD	1116	333	29.8	9.27
	SFLT	PELS	19	2	10.5	0.06
	SFLT	PLCK	711	395	55.6	11.00
	SFLT	POP	7	7	100.0	0.19
	SFLT	SABL	125	13	10.4	0.36
	SFLT	SFLT	3903	409	10.5	11.39
	SFLT	SLPR	63	8	12.7	0.22
	SFLT	SRRE	36	4	11.1	0.11
	SFLT	THDS	42	1	2.4	0.03
TOTAL			9203	3591	39.0	100.00

Table 2. **Calculated discard mortality rates (percent) for halibut in 1990 through 1992 groundfish fisheries. Alternatives for projecting 1994 discard mortality rates are also shown, along with the rates used by NMFS for 1993 fishery management.**

Region/Fishery	Disc. Mortality Rate			1994 Alternatives[1]			Used In'93
	1990	1991	1992	Alt. A	Alt. B	Alt. C	
BSAI TRAWL							
MWT Pollock	81	81	87	84	83	83	80
Atka mackerel	69	73	62	68	68	70	70
Rocksole/O. flats	58	68	78	73	68	65	70
Yellowfin sole	73	74	78	76	75	75	70
Pacific cod	68	60	67	63	65	65	60
BT Pollock	65	59	76	68	67	66	60
Rockfish	62	54	59	56	58	59	60
Arrowtooth	57	41	68	54	55	48	40
Grnld. turbot	58	38	-	38	48	53	40
Other sp.	36	29	75	52	46	54	40
GOA TRAWL							
MWT Pollock	63	74	69	72	69	66	75
Rockfish	61	65	69	67	65	62	60
Shallwtr flats	63	61	62	62	62	62	60
Other sp.	65	59	64	61	62	62	60
BT Pollock	62	56	70	63	63	63	55
Pacific cod	61	55	60	58	59	58	55
Deepwtr flats	57	52	59	56	56	57	55
BSAI H&L							
Pacific cod	17	21	19	20	19	18	18
Sablefish	12	17	19	18	16	14	12.5/15
Rockfish	19	29	9	19	19	21	12.5/15
Grnld. turbot	12	42	17	30	24	17	12.5/15
GOA H&L							
Pacific cod	13	17	30	23	20	17	16
Sablefish	11	28	23	25	20	13	14/17
Rockfish	15	20	-	20	17	15	11.5/14
BSAI POT							
Pacific cod	7	3	12	8	8	10	5
GOA POT							
Pacific cod	10	4	16	10	10	13	5

[1]Alt. A = 2-year running average; Alt. B = 3-year running average; Alt. C = pooled 1990-92 data.

NORTH PACIFIC FIXED GEAR COALITION

June 3, 1991

Mr. Larry Cotter, Chairman
Ad Hoc Bycatch Committee
North Pacific Fishery Management Council
605 West 4th Avenue
Anchorage, AK 99501

RE: Preferential Fixed Gear Access to Demersal Groundfish Species

Dear Larry:

Recent trawl bycatches of herring, salmon and halibut in the Bering Sea and Gulf of Alaska have re-emphasized the urgent need for effective prohibited species bycatch controls in the groundfish fishery. This circumstance is very much like that which in 1980 caused Nunam Kitlutsisti to file an action in the U.S. District Court of Alaska challenging the adequacy of federal regulations addressing BSAI prohibited species bycatch (please see Literature Referenced, #1, attached). Today we have grave concerns about trawl bycatch being voiced not only by fishermen, sports fishermen, rural Alaskans and environmentalists, but also by the Canadians. Despite the diligence of your committee and the creation of a dizzying maze of regulations, real progress on bycatch issues has been limited.

It would appear that we are repeating history in this regard. Having failed to apply preventive medicine ten years ago, we are now faced with the prospect of major surgery - and we seem to have some difficulty mustering the courage. It is time to readdress the problem and to take appropriate action during the 1992 bycatch amendment cycle.

In response to the situation in 1980, the Ad Hoc Working Group on Prohibited Species and the SSC produced Council Document #13, a collection of scientific papers describing the PSC bycatch problems and suggesting solutions. The ninth paper, **"Methods of Reducing the Incidental Catch of Prohibited Species in the Bering Sea Groudfish Fishery Through Gear Restrictions"**, hit the nail on the head. (#1) It observed that the incidental catch of prohibited species is much less with longlines or off-bottom trawls (truly pelagic trawls which do not touch the bottom) than with on-bottom trawls, and recommended consideration of two management alternatives involving gear restrictions:

(1) prohibit on-bottom trawls in all areas, i.e., groundfish will be harvested only with longlines and off-bottom trawls; and (2) on-bottom trawl gear will be allowed only in areas defined as yellowfin sole or turbot grounds.

Analysis revealed that the estimated savings of prohibited species would be dramatic. Alternative (1) greatly reduced the catch of all prohibited species: halibut catches were reduced by about 92%, Tanner crab and king crab catches by 99%, and salmon catches by over 80%. Alternative (2) also reduced catches of prohibited species, but the reductions were less than for alternative (1). **For both conservation and economic reasons it would have been best if fixed gear had been prescribed as the only allowable gear for certain demersal groundfish fisheries, a decade ago.**

The North Pacific Fixed Gear Coalition now respectfully requests that the Ad Hoc Bycatch Committee recommend analysis of a fixed gear preference for demersal groundfish species in the BSAI, as part of the 1992 bycatch amendment.

Please consider the reasoning which supports this request:

I. Reduction in Prohibited Species Mortality

Substantial PSC bycatch savings could be realized if fixed gear were employed exclusively in the BSAI fisheries for Pacific cod, sablefish and turbot. (#1) Mortality inflicted on halibut by hook-and line gear is calculated by the IPHC at 16% of the bycatch, while trawl-inflicted mortality may be as high as 100% (there is some dispute over this latter figure, and a somewhat lower number may be justified - halibut mortality on shoreside delivery trawlers is calculated at 50%; Fisheries Information Services [FIS] has used a compromise figure of 85% for overall trawl mortality in the attached report). Longliners are working with the IPHC to further reduce their halibut bycatch mortality.

In the 1990 longline fishery for cod in the BSAI, halibut mortality per ton of cod was 5.8 kg. The halibut mortality in the 1990 BSAI trawl fishery for cod was 27.8 kg per ton of cod. The trawl fishery mortality was 4.8 times that of the longline fishery, by weight. During the first four months of 1991, the longline rate was 2.5 kg of halibut killed per ton of cod. The trawl rate was 21.9 kg per ton of cod. The trawl mortality was 8.8 times that of the longline fishery, by weight. (FIS)

It is estimated that 1,624 mt of halibut could have been saved in 1990 if the entire TAC for BSAI cod had been taken by longline gear. For the first four months of 1991, 1,374 mt could have been saved had the catch been taken with

longline gear. By contrast, if the entire 1990 BSAI cod TAC had been taken by trawlers (assuming no PSC caps), 6,299 mt of halibut would have been lost. (Mortality figures, FIS)

Additionally, bycatch of at least 15,000 king and more than 1.5 million Tanner crab would have been avoided in 1990 if longline gear had been used exclusively in the BSAI cod fishery. (FIS)

Beyond these considerable savings, it is noteworthy that longline bycatch of salmon and herring is insignificant.

Please see attached report from Fisheries Information Services for additional information.

II. Achieving Optimum Yield

In 1990 some 60,000 mt of BSAI cod were left unharvested because of trawl closures due to PSC bycatch caps. (FIS)

Had enough fixed gear been deployed in the fishery, OY could have been achieved easily within the bycatch limits.

III. Reduction in Discards

Trawl catches often include fish of the target species which are too small or too large to be processed, or which are severely damaged. These catches also include non-target species which may be targeted by other fisheries, or species which are not conveniently marketable. These fish are often discarded at sea. The trawl discard problem can be a very substantial one, especially when added to the discard of valuable prohibited species. (#3,5,6,7,10; also see FIS Report) Some researchers report that trawl discards are unavoidable, and that little can be done technically to decrease the amounts of discards. (#6) The recent failure of "pelagic" trawls in the BSAI cod fishery supports this contention. (#9)

Longline fisheries are size and species selective, and have few bycatch problems requiring the discard of fish. (#1,2,3,4,5,6,7) Virtually all of the cod caught in the directed BSAI longline fishery are utilized. Skate wings and rock fish are retained and marketed. Very little is thrown back. Bycatch in the fishery is said by NMFS to be 5% of the total catch (See FIS report).

Considerable savings of discards can be achieved through the use of fixed gear.

IV. Conservation-Oriented Fishing

"Today there is agreement among fisheries scientists that fishing has a significant impact on the dynamics of fish populations. Mobile and passsive fishing gears have different abilities to fish selectively for fish of particular size and species. **Proper management of fish stocks should therefore not be based only on recommendations on total catch quotas, but also on how the quotas are taken."** (Bjordal and Laevastu, # 2 below, emphasis added) Selection of an optimal fishing regime requires that the conservation aspects of different gear types be taken into consideration:

A. Size Selectivity - Longline gear is size-selective; large hooks and large pieces of bait catch large fish. (#2,3,4,5,6,7,8) Bjordal and Laevastu estimate that if longlines, rather than trawls, were used to harvest a given quota of cod in the BSAI, a greater biomass would remain in the sea; that at a given stock level, higher annual catches can be taken with longlines than with trawls; and that removal of older cod benefits recruitment by reducing cannibalism. (#2) Large cod are also an important predator of commercially valuable crabs. (#6)

Compared with longline gear, trawl gear is a much more powerful tool for catching small fish. Codend selection is most important for small fish, but clogging of meshes or large catches that stretch (close) the meshes are factors that give very poor selection properties. (#2,3,6,7)

B. Species Selectivity - Longlines have good species-selective properties, and non-commercial bycatch is normally modest. (#3,4)

A trawl will in principle catch all fish in the swept volume, except those that are selected through the meshes. Large bycatches of different non-commercial species are therefore not uncommon in trawling. (#3,6)

C. Product Quality - Line caught fish are usually of much higher quality and command higher prices than net-caught ones. (#4) While both gear types may produce fish of high quality, big trawl hauls and hauls of long duration may lead to reduced quality because the fish are exposed to high pressure in the codend, and because it may take too long before parts of the catch are processed. (#3)

D. Negative Effects on the Environment - Longline gear does not have destructive effects on bottom topography or fauna. Trawl gear may have a severe impact on the bottom environment. (#3)

E. Energy Conservation - Compared with trawling, longlining is regarded as a low energy fishing method. (#3) It appears that gear which requires little energy, such as longline gear, is being used increasingly in preference to active gear. (#4)

F. Fishing on Spawning Stocks - Canadian authorities are sufficiently concerned about intense trawling on spawning cod stocks and uncertainties about the effect of such activity on mating behavior, spawning success and possible localized depletion that they have prohibited directed fishing for northern cod during the peak spawning season. (#8) Similar concerns are expressed with regard to BSAI pollock in the preamble to the rule which seasonally apportions pollock TAC in the BSAI, and in the preamble to the 1991 BSAI TAC specifications. A cautionary note with regard to fishing on spawning cod stocks is contained in the DRAFT SEIS for Amendment 18/23.

Trawlers can and do conduct intense fisheries on spawning stocks. Only PSC caps have prevented them from harvesting the entire BSAI cod TAC in a short pulse fishery. By contrast, the longline fishery for cod is prosecuted slowly over the year, averaging less than 1,000 mt per week in the BSAI during 1990. Unlike trawl gear, longline gear is limited absolutely in its daily catch level by the number of hooks it can deploy. (#5) A longliners cannot accelerate its harvest during the spawining period.

From a conservation perspective, longlining is clearly preferable to trawling for the harvest of demersal species like cod.

V. Market Implications

Because line-caught fish are generally of the highest quality, they generally command the highest prices. (#3,4) The Council has heard repeated testimony to the effect that the market wants a steady supply of fresh fish throughout the year - most recently at the April Council meeting. The BSAI longline fishery for cod is conducted slowly, providing that supply.

Maximization of returns from the resource and market demands indicate that longlining is the best method for harvesting cod in the BSAI.

VI. Data Gathering

Estimating the catch of distant water factory trawlers and mothership fleets is difficult and subject to several sources of error. The weight of groundfish catches in the BSAI is not obtained from scales, but by visual assessment of the cod end or some other indirect method. If limits on

the catch are not rigorously monitored and enforced, inacccurate reports of catch (including discards) may result. In addition to the underlogging of catches, undersized or undesirable species (in addition to prohibited species) may be discarded to maximize catches under a mix of species quotas. Further, verification of catches by onboard observers is complicated by several factors such as the size of factory ships and fishing vessels, the size of catch and the rapidity of processing. Under these conditions estimates of catches are uncertain and their verification difficult. (#6)

Longline vessels catch their fish one at a time, landing them at a single location on the vessel. Observation and data gathering are a relatively simple process.

It is far easier to gather catch, discard, and prohibited species bycatch data on longliners than on trawlers.

VII. Costs of Management and Enforcement

The deployment of trawl fleets with massive fishing power requires intense regulation to protect prohibited species, prevent overfishing, prevent conflict with other fisheries. (#6) "Overmanagment" rather than "overfishing" has become a concern in some regions, such as the eastern Bering Sea and the Gulf of Alaska. (#6) In the BSAI groundfish fishery we now have zones, zones within zones, primary and secondary closures, caps, fishery-apportioned caps, seasonally apportioned caps, seasons, incentive programs, etc., aimed primarily at controlling trawl effort. These are in addition to observers and elaborate reporting requirements. The system requires development, implementation, administration and enforcement of complex regulations. It is so complicated it sometimes baffles those responsible for inseason management. Trawl companies must now hire specialists to keep their vessels in compliance with these ever-changing rules. All of this is very expensive - to the taxpayer and to the fisherman. (#7)

The other problem with this band-aid approach is that it doesn't work - witness the recent PSC bycatch problems in both the BSAI and GOA, the continuing early closures of directed fisheries. But there is an alternative.

Several authors, having studied the subject thoroughly, have suggested that longline fisheries for groundfish can be prosecuted without micromanagement and its attendant frustrations and expenses. (#1,5,7) BSAI longlining is species-specific, and prohibited species mortality is de minimus. Other discards are minimal. The harvest is slow, and there is no danger of overfishing due to accelerated

harvest capacity. The size (and age) of the directed catch can be controlled very simply by regulating the size of the hooks employed, if such control is found necessary. In the BSAI longline fishery there is no realistic need for 100% observer coverage. One author states that in the cod fishery off Nova Scotia, "The longliner fleet could be left essentially unregulated since it is not economical for it to overfish the stock." (#5) Another states, "Longliners can be managed by hook size only; the hook size should make it probable that the fish will spawn at least twice prior to capture." (#7) Bjordal and Laevastu observe, "The study recommended restrictions on bottom trawling to reduce PSC bycatch problems, while similar restrictions were not found necessary for longlines and off-bottom trawling." (#2,1)

The hypermanagement and associated costs necessitated by excessive trawl effort can be substantially avoided in certain of the demersal groundfish fisheries by the use of fixed gear.

VIII. Efficiency

The notion that trawling is somehow the most "efficient" method of harvesting all demersal species lies at the heart of our contemporary management difficulties. Certainly trawl technology is appropriate for the harvest of yellowfin sole and perhaps certain other bottom species, so long as bycatch problems are controlled. Beyond that, the employment of passive gear should be encouraged.

The key to this analysis is the "hidden" costs of bottom trawling, the real biological and social costs or "externalities" which are shifted from the trawl industry to society under our current management system. Peter Matthews states the general case dramatically:

"Ladies and gentlemen, the list goes on and on! The problem is not confined to Atlantic Canada; it is a world-wide problem. Every country which has a major trawling industry has similar problems and costs. In Atlantic Canada, the hidden costs of operating trawlers probably add billions of dollars a decade to the fishing industry's bill to the nation's tax payers. For example, I am convinced that if these costs were accurately measured and allocated, the true cost of landing a pound of fish with that 90' combination trawler/seiner would be significantly higher than to land a pound with the 99' steel longliner. To my knowledge, however, these costs have never been studied in anything more than the most superficial way. The time has come to do so. All of us, politicians, bureaucrats, industry leaders, both in the companies and those representing fishermen, have all been guilty of the cardinal sin of: 'Not being able to see the wood for the trees'. There might have been a few lone voices out there, trying to

highlight the problems with trawler technology, but they have been pushed to one side by the majority, myself included, who had only one desire and that was to catch more fish, 'economically'."

"This has been particularly true since the introduction of the diesel engine to the trawler fleets of the world; for convenience let's say since the end of World War Two. In 1946, the oceans were teeming with fish. The supply was apparently endless and populations needed to be fed. The trawler was cheap to build, efficient, and nobody was really concerned about conservation or, if they even thought about it, it was someone else's problem. Most of us got caught up in the process of technological innovation, which dazzled us and made the trawler ever more efficient and ever more destructive with the result that, gradually over the past forty years, one fishery after another has collapsed. This has led to an endless cycle of crises in world fisheries followed by regulations designed to improve the local situation but which never did, such as fishery closures or cut backs to allow stocks to recover, so that we could start the cycle all over again. We must all have been mad! The fact of the matter is that, on a world wide basis, we were blind and never really stopped to look at the whole problem...**environmental costs must be factored into the equation if the true costs of catching fish are to be determined.**" (#7)

Technically, the mechanical effectiveness of longline fishing has been significantly increased over the last fifteen years. This has been achieved by increased effort through mechanized baiting and gear handling, and by improved catching performance of the gear. (#3) More important, longliners in the BSAI are highly efficient from a conservation perspective. (#3) PSC bycatch mortality and waste are minimal. Elaborate regulation and enforcement are unnecessary. (#1,5,7) Considerable savings can be realized through the rational employment of longline effort.

If bottom trawl operations were obliged to internalize their true biological, environmental, regulatory, enforcement and social costs - which are now shifted to society - they would not look so "efficient". They are in fact being heavily subsidized by other fishermen, by the American taxpayer, and by consumers.

Mr. Matthews concludes: **"There must be a significant phasing out of offshore trawlers, to be replaced by offshore longliners."** (#7)

IX. Fairness and Equity

"The complex problems of 'fairness' and 'equity'...have two basic criteria connected with them -- need and

responsibility." (#6) The need pertains to the fishermen, including jobs, potential for profits, and supply of protein. The overriding responsibility is for protecting and conserving the public resources which produce those benefits.

Where different gear types have dramatically different conservtion implications for the variety of species found within a complex, the manager's job in determining which gear type should be utilized is relatively simple. The responsibility for conservation must to a degree override the need for jobs and profits. In this case, fixed gear should be given preference over mobile gear in the harvest of certain demersal groundfish species. "Fairness toward the ecosystem" should prevail.

In order to put things in perspective, assume that the entire 1991 BSAI TAC's for Pacific cod, turbot, and sablefish were reserved for exclusive harvest by fixed gear (provision would have to be made for bycatches in other fisheries, of course). The combined tonnage would be 241,200 mt - only 12% of the tonnage available (though a greater proportion of the total value). The trawl fleet would still have 88% of the tonnage for its exclusive use.

Considerations of fairness and equity should not prevent preferential treatment for fixed gear in the harvest of demersal species.

X. Conclusion

Progress in the control of prohibited species bycatch in the BSAI trawl fishery has been limited over the last decade. Despite the development of a highly complex regulatory structure to prevent the interception of prohibited species, crises continue unabated.

In 1981 Council Document #13 suggested that groundfish might be harvested only with longlines and truly pelagic off-bottom trawls in the BSAI, with possible exceptions for yellowfin sole and turbot. (1) The supporting analysis suggested that prohibited species savings would be dramatic. This policy was not adopted to guide development of the nascent DAP groundfish fishery, with the result that considerable resources were invested - or perhaps misinvested - in bottom trawl technology. Society is now paying the price in the many ways outlined above. Crisis follows upon crisis, with no effective response. It is time to take action. **Fixed gear should be given preferential access to demersal species wherever practical.**

Prohibited species problems are only the tip of the iceberg, however. Please consider the following:

1. TAC for BSAI Pacific cod could be achieved by fixed gear without exceeding PSC limitations;

2. Considerable savings of other discards could be achieved through the use of fixed gear;

3. From a conservation perspective - size selectivity, species selectivity, product quality, environmental impacts, energy conservation, fishing on spawning stocks - longlining is clearly preferable to trawling for the harvest of demersal species like cod;

4. Line-caught fish are generally of the highest quality, and generally command the highest prices. Markets demand a steady supply of high quality product throughout the year. While trawlers often thrive on pulse fisheries concentrated on spawning stocks, longliners in the BSAI harvest slowly throughout the year, over the full geographic range of the stocks;

5. There is some uncertainty as to the accuracy of trawl catch data - total catch, prohibited species catch, discards. Data gathering on longline operatons is not so difficult;

6. The micromanagement made necessary by the massive trawl fleet places great economic burdens on government, industry, and the public. Micromanagement is unnecessary for longlining operations;

7. Trawl operations externalize the true biological, regulatory, enforcement and social costs of their fishery, which are borne by other fishermen, the American taxpayer, and conusmers. If these costs are factored in, trawl operations appear considerably less "efficient" in the economic sense. The mechanical effectiveness of longline fishing has been significantly increased over the last fifteen years. Longline operations are very "efficient" in the broader context; and

8. The overriding duty of fishery managers is to protect and conserve the fishery resources which produce jobs, food, and profits. Where one gear type has substantial conservation advantages over another, questions of "fairness and equity" should not stand in the way of preferential treatment for the conservation-oriented gear. "Fairness to the ecosystem" should prevail.

The many problems posed by bottom trawling are not "an economic reality", nor are they "just a cost of doing business". They can be avoided.

For the above reasons the undersigned associations respectfully request that the Ad Hoc Bycatch Committee recommend to the Council that a fixed gear preference for demersal species in the BSAI groundfish fishery be analysed as part of the 1992 bycatch amendment.

An effective way to implement such a policy would be to assess the intention and ability of the domestic fixed gear industry to harvest demersal species each year, and to apportion TAC accordingly. This would allow a gradual implementation of the preferential policy, while ultimately maximizing its advantages.

Thank you for your attention.

Sincerely,

Kodiak Longline Vessel Owners' Association
Fishing Vessel Owners' Association
Petersburg Vessel Owners' Association
Freezer-Longliner Group

LITERATURE REFERENCED

A considerable body of scientific work comparing trawl gear to fixed gear has emerged over the last decade. These analyses address and support the contention that fixed gear is superior to trawl gear for the harvest of demersal fish like cod, especially if conservation issues are taken into account. Several of these studies are summarized and/or quoted below. Most are reproduced in material part at the similarly numbered appendices.

It should be noted that only two of these studies directly address the Pacific cod fishery in the BSAI region - and that the first reflects conditions ten years ago, when foreign harvesting and processing elements were present. The others are general works reflecting experience in groundfish fisheries around the world, or are more specific to cod fishery experience in particular countries such as Canada and Norway. Stock status and exploitation strategies vary. **No claim is made here that these studies are definitive for conditions now prevailing in the BSAI cod fishery.** Rather they are presented to offer insights into the nature of longline and trawl fisheries for cod, the issues which differentiate them, and the patterns which may emerge if conservative cod fishery management is not employed in the BSAI.

1. REDUCING THE INCIDENTAL CATCH OF PROHIBITED SPECIES BY FOREIGN GROUNDFISH FISHERIES IN THE BERING SEA, NPFMC Council Document #13, April, 1981.

The developement of Council Document #13 was hastened by the occurrence of events a decade ago which parallel remarkably the events of the last few months. The BSAI and GOA groundfish plan teams were preparing a brief entitled "Controlling the Incidental Catch of Prohibited Species", which addressed in general terms a variety of management options to control incidental catches of PSC species in the foreign-dominated groundfish fisheries. Simultaneously information was released from the Northwest and Alaska Fisheries Center which showed that the incidental catch of salmon by foreign trawlers in the BSAI had increased several-fold in 1979. Alarmed by prospects that the incidental taking of salmon and herring by foreign trawlers might adversely affect the native populations of western Alaska, a native organization called Nunam Kitlutsisti petitioned the Council to close the better part of the Bering Sea to foreign fishing October 1 through March 31 each year. When the petition was denied, Nunam Kitlutsisti and 25 other plaintiffs brought an action in the U.S. District Court of Alaska to challenge the adequacy of regulations addressing prohibited species bycatch.

Thus stimulated, the Council's Scientific and Statistical committee directed that a working group be formed to investigate in greater depth alternative approaches for reducing the catch of prohibited species in the Bering Sea groundfish fisheries. Council Document # 13, a series of scientific papers, was the result.

REDUCING THE INCIDENTAL CATCH OF PROHIBITED SPECIES IN THE BERING SEA GROUNDFISH FISHERY THROUGH GEAR RESTRICTIONS, by Wespestad, Hoag, and Narita, reprinted as IPHC Technical Report No. 19, 1982, was one of the papers.

This report observes that the incidental catch of prohibited species is much less with longlines or off-bottom trawls than with on-bottom trawls. It examines two management alternatives involving gear restrictions: (1) **prohibit on-bottom trawls in all areas, i.e., groundfish will be harvested only with longlines and off-bottom trawls; and (2) on-bottom trawl gear will be allowed only in areas defined as yellowfin sole or turbot grounds.**

Trawl tests led to the conclusion that pollock can be fully harvested with off-bottom trawls. Squid, Atka mackerel, and rockfish can be partially harvested with off-bottom trawls. Pacific cod, sablefish and large flounders (primarily turbot) can be effectively taken with longline gear. Yellowfin sole and flounders could not be harvested with either off-bottom trawls or longlines. To harvest these species would require allowing on-bottom trawls in at least limited areas or time periods as suggested in Alternative (2).

Estimated savings of prohibited species were dramatic. Alternative (1) greatly reduced the catch of all prohibited species: halibut catches were reduced by about 92%, Tanner crab catches and king crab catches by 99%, and salmon catches by over 80%. Alternative (2) also reduced catches of prohibited species but the reductions were less than for Alternative (1). High incidental catches of halibut and crab were estimated for the on-bottom trawl fishery for turbot, and large catches of Tanner crab occurred in the yellowifn sole fishery.

The study recommended restrictions on bottom trawling to reduce PSC bycatch problems, while similar restrictions were not found necessary for longlines and off-bottom trawling. Had this policy been adopted in 1981 as a guide for DAP fishery development, most of our current prohibited species bycatch problems would have been avoided.

2. <u>EFFECTS OF TRAWLING AND LONGLINING ON THE YIELD AND BIOMASS OF [BSAI] COD STOCKS - NUMERICALLY SIMULATED</u>, Bjordal and Laevastu, ICES Paper C.M. 1990/G:32 Ref. B.

Increased fishing effort and improvement of fishing gear and methods have during the last 30 years coincided with a considerable decrease of major fish stocks despite a rising number of regulations to manage the fish resources. Today there is agreement among fisheries scientists that <u>fishing</u> has a significant impact on the dynamics of fish populations. Mobile and passive fishing gears have different abilities to fish selectively for fish of particlar size and species. **Proper managment of fish stocks should therefore not be based only on recommendations on total catch quotas, but also on <u>how</u> the quotas are taken (i.e., what gear types should be used).**

To determine an optimal catching regime (gear type and effort), the conservation aspects of the different gear types should be taken into account: species and size selectivity, discards, survival after escapement, fish quality, environmental aspects and energy conservation.

The results of this numerical study suggest that BSAI Pacific cod are recruited to the trawl fishery one year earlier than to the longline fishery. More prefishery juveniles are caught with trawls than with longlines, and consequently the amount of discards is higher from the trawl catch than from the longline catch. The study concludes:

a. The type of gear used in a fishery may have a marked effect on the dynamics of a fish stock - in this case it is predicted that if a given catch quota of cod is taken by longlines, a higher biomass will remain in the sea than if the same quota is fished with trawls. The difference in cod biomass (weight) remaining in the sea is even greater after four years of fishing with trawls versus longlines;

b. If a given stock level is desired, higher annual catches can be taken with longlines than with trawl gear;

c. Cod become more cannibalistic with increasing age. Since longline catches include more large fish, longlining is beneficial to recruitment to the extent the latter is controlled by predation; and

d. These results indicate that some longline fishing might be allowed to continue when TAC for trawlers has been reached.

3. RECENT DEVELOPMENTS IN LONGLINE FISHING -- CATCHING PERFORMANCE AND CONSERVATION ASPECTS, Bjordal, Institute of Fishery Technology Research, Bergen, Norway, 1988.

During the last fifteen years the effectiveness of longline fishing has been significantly increased. This is achieved both by increased effort through mechanized baiting and gear handling, and by improved catching performance of the gear.

The conservation aspects of longline gear are compared to those of trawl gear in the groundfish fishery off Norway.

a. Size Selectivity, Longline Gear - The longline is regarded as a size selective fishing gear, particularly if large hooks and large pieces of bait are used. Large fish will take large or small baits, while small fish will only take small baits. In the Arcto-Norwegian cod fishery, the trawl catches contained on average 19.4% small fish (less than 45 cm headed) compared with 6.1% for longline, clearly indicating that longline is a more conservation-oriented fishing method than trawling with respect to the exploitation of the younger fish groups. Note that discards were not included in these figures.

b. Size Selectivity - Trawl Gear - Compared with longline gear, the trawl is a much more powerful tool for catching small fish. Codend selection is most important for small fish, but clogging of meshes (eg, by flatfish or rockfish) or large catches that stretch (close) the meshes, are factors that may give very poor slection properties.

c. Species Selectivity - Longlines have good species selective properties, and non-commercial bycatch is normally modest. A trawl will in principle catch all fish in the swept volume, except those that are selected through the meshes. Large bycatches of different non-commercial species are therefore not uncommon in trawling.

d. Fish Quality - Both longliners and trawlers may produce fish of high quality. However, big trawl hauls and hauls of long duration might lead to reduced quality, both because the fish are exposed to a high pressure in the codend, and because it might take too long before parts of the catch are processed. This is no problem in longlining since most of the fish are alive until onboard processing. Fish caught by longline are in general regarded to be of a better quality than trawl caught fish.

e. Negative Effects on the Environment - Ideally, a conservation oriented fishing method should not have destructive effects on the environment - bottom topography and bottom fauna. Longline gear fulfills this requirement. Trawl gear might on the other hand have severe impact on the

bottom environment. However, there is no available information regarding possible corresponding negative effects on the fish stocks.

f. Energy Conservation - Compared with trawling, longlining is regarded as a low energy fishing method. From a fuel saving point of view, longlining is superior to trawling. If the cost of longline bait is factored in, the longline fuel/catch ratio per kilogram of fish is still far below the relative fuel consumption in trawling.

The longline must be evaluated as a conservation-oriented gear, while trawling has a rather low conservation-oriented effect.

4. A METHOD FOR TESTING THE EFFECTIVENESS OF DIFFERENT FISHING BAITS IN THE SEA - Johnstone and Hawkins, Marine Laboratory Aberdeen, Scottish Fisheries Information Pamphlet Number 3, 1989.

During the 19th century the most popular demersal fishing method in Scottish waters was the long line. By 1880, however, the trawl and steam trawler had been introduced to east coast grounds, and the beginning of the 20th century saw a decrease in line fishing. The main advantage of the trawl over the long line was its greater efficiency in terms of catch per unit effort, ie more fish caught for the labour expended. Nevertheless line fishing has some advantages over more efficient methods. First, line caught fish are usually of much higher quality and command higher prices than net-caught ones. Secondly, lining is a more selective fishing method, and by alteration of the bait, the hook, or the line configuration different species or different sizes of fish can be caught and the capture of immature fish avoided. Also, with increasing fuel costs lining has become a much more attractive economic proposition, particularly since the method permits areas to be exploited which may be inaccessible to nets.

5. A BIOECONOMICAL MODEL OF AN AGE-STRUCTURED GROUNDFISH RESOURCE, EXPLOITED BY A MULTI-GEAR FISHING FLEET, O'Boyle, Sinclair and Hurley, Rapp. P. V. Reun. Cons. Int. Explor. Mer. XX:000-000, 1990.

A bioeconomic model of the Scotian Shelf (Nova Scotia) groundfish fishery involving trawler and longliner fleets was constructed to examine the biological, economic, and regulatory consequences of the interaction of these two fleets. Trawlers catch younger fish than longliners and the revenue-cost pictures are very different. The results of simulation indicated that both yield and employment were superior for longliners. However, trawlers, although

experiencing higher operating costs, could "out-compete" longliners due to higher sustained catch rates and thus revenue per unit cost. From a regulatory point of view, it was determined that under the assumptions of this study, the fishery could be managed by regulating only trawler activity. The longliner fleet could be left essentially unregulated since it is not economical for it to overfish the stock.

Conflicts have arisen between longline and trawl fishermen in the Scotian Shelf groundfish fishery regarding access to the resource. Transfers between fleets have usually been one way - from longliners to trawlers. Two factors are responsible for this. First, trawlers harvest large numbers of young cod which are not yet recruited to the longline fishery. Second, longlines are size-selective, and tend to catch larger, older fish. Trawl fishing mortality substantially reduces abundance before cod reach the size at which they are vulnerable to longlines. From an economic perspective, the longliner fleet has a clear advantage over the trawlers. The fixed price of fish to longliners is higher than to trawlers, and the cost per day of fishing is lower. From the standpoint of maximizing net revenues, employment and salaries there are advantages to a pure longline fishery. By gaining access to the resource first, however, trawlers will reduce the yield potentially available to longliners.

The results of the study indicate for the Scotian Shelf fishery (1) that the economic yield and employment picture is superior for longliners, (2) that without constraints, the trawlers will "out-compete" the longliners; (3) that longliners are unlikely to over-exploit the resource; and (4) that effort regulation is only necessary for trawlers to protect the cod resource.

6. <u>FISHING AND STOCK FLUCTUATIONS</u>, Laevastu and Favorite, Fishing News Books Ltd., 1988.

The quantitative increase of fish consumed in relation to the size of cod is shown in Figure 5.16. This fact might become significant in future fisheries management as the realization that recruitment in many species might be controlled by predation gains wider acceptance. It might be desirable to promote the catching of larger predators, for example, by a longline fishery, to decrease predation of prefishery juveniles. Large cod are also an important predator of commercially valuable crabs (Robichaud et al., 1986), thus it might be beneficial for crab stocks to hold stocks of large cod down by heavy exploitation...(p. 97)

Discards are fish which are caught but thrown back into the sea because they are below the legal size, too small,

unmarketable, deformed, and/or infested with visual parasites...In some regions, such as the NE Pacific, the prevailing fishery regulations prohibit the retention of some high priced fish, such as salmon and halibut...Mixed catches and bycatches arise because the gear, especially mobile gear such as the trawl, catches everything accessible to it on the bottom in front of its sweep...Different gear has, however, different selectivity in respect to species and sizes...a fishery for pelagic species with purse seines can be rather selective...Longlines can be selective to some degree depending on the hook size and bait used...(pp. 132, 133)

Although discards are unavoidable, it is of some importance in research assessment that discards be included in estimates of the total catch of a given species, and that their role in regard to resource assessment, future recruitment, and food balance in the ecosystem be considered. At present, considerable effort is made in ICES countries to account for the effects of discards in stock assessment by adjusting the data on the reported landings and their age composition. However, other parts of the world, such as the NE Pacific, the amounts of discards (other than "prohibited species") are not [explicitly] estimated and consequently are not [explicitly] accounted for in stock assessment...(p.136)

Little can be done technically to decrease the amounts of discards. The selection of proper mesh size, alteration of the rigging of the trawl, and changing the area, ground and depth of fishing are the main, but often ineffective, attempts to decrease undesirable byactches. The regulatory limitation of bycatch of prohibited species has been designed to prevent "foreign" fishing or to shift it to other areas. The latter can work only to a very limited degree in specific locations; the shifting of vessels from an otherwise profitable fishing ground will nearly always result in considerably lower and, in most cases, unprofitable catches. The possible changes to the rigging of the gear have also been tried, but with little general success (Japan Fisheries Agency, 1986). Obviously, in some cases the increase of mesh size will decrease the bycatch of undersized species to a limited degree (Lamp and Weber, 1984)...(p. 137)

Although at present fisheries scientists have limited ability to explain the causal mechanisms of recruitment fluctuations or to predict stock sizes four or five years agead, fishery managers have some means avaialble to reduce the unfavorable effects of the variability of catches on the fishing industry. Examples are, limitations in landings or <u>limitations of gear</u>, and <u>influencing the</u> size and <u>composition of the fleet</u>...(p. 187, emphasis added)

The trawl fisheries of the eastern Bering Sea and Gulf of Alaska (EBS/GOA) have been regulated by a number of time and area closures. Most of these closures were made not for the protection of the target stocks or their life history components, but for the purposes of minimizing the incidental catch of certain species or avoiding conflict with other fisheries (e.g., eastern Bering Sea crab and halibut stocks and fisheries)...(p. 202)

At pages 202-203 (see appendix 6), the authors emphasize the difficulties in obtaining accurate estimates of the catch, discards of undersized or undesirable species, and discards of prohibited species, of distant water factory trawlers and mothership fleets - even with observers aboard.

Several profound changes have occurred in marine fisheries and their resources in the last two decades...the causes of large fluctuations of stocks is not fully known nor has knowledge of the effects of fishing on stocks much improved. Furthermore, as many governments have stepped into the fisheries management with new vigor, "overmanagement" rather than "overfishing" has become a concern in some regions, such as the eastern Bering Sea and Gulf of Alaska...(p. 207)

The effects of a given fishing effort on a stock depends on the selectivity and effectiveness of the gear and the behaviour of fish in respect to the gear. Some progress on the study of the latter subject has been made, whereas the effectiveness of trawls in respect to different species is poorly known...It appears that gear which requires little energy, such as longlines and gill nets, is being increasingly used in preference to active gear. Research on the improvement of these passive gears, including the use of artificial baits, effective hook spacing, effects of tidal currents on catches, etc. is in progress in several laboratories...(p. 208)

Full utilization of marine living resources would also require the utilization of discards. These vary normally between 30% and 50% of catches, but can reach as high as eight times the landings in the Gulf of Mexico shrimp fishery. Utilization of discards raises several problems such as space on vessels and processing...(p. 211)

Since most of the marine fish resources are nearly fully exploited, fishing is now moving from a hunting stage to one of cultivation as evidenced in this decade by rapid expansion of mariculture...The real cultivation state in marine fisheries will most probably start with manipulation or steering of the fish ecosystems at large with a <u>selective</u>, directed fishing effort...(p. 122, emphasis added)

A new fairness issue might be the "fairness toward the ecosystem" -- i.e., utilization of the production in a fish ecosystem for the optimum provision of fish and other marine organisms consumed by humans...(p. 213)

7. A BLUEPRINT FOR THE YEAR 2000, Peter Matthews, paper presented to the Oceans Instutute of Canada International Longlining Symposium, Halifax, Nova Scotia, November, 1990.

Mr. Matthews is Vice President, Fleet Operation, Clearwater Fine Foods. He was formerly employed by the U.K. White Fish Authority, Industrial Development Unit. His experience includes the management of a large fleet of stern trawlers and offshore longliners on the Atlantic coast of Canada. His subject was **"Costs of Longlining vs. Trawling"**.

After comparing traditional fixed and variable costs for the operation of several classes of vessel, Mr. Matthews offered the view that environmental costs must be factored into the equation if the true costs of catching fish are to be determined. He pointed out that trawlers off the Atlantic provinces catch fish much smaller and younger than those caught by longliners, resulting in lost fishing opportunity from the fish that are not allowed to grow. He also stressed that the discard rate of longliners in the fishery is only two tenths of one per cent of their harvest - far less than that of the trawl fleet. His list of additional costs of trawler production includes:

- The cost of damaged, discarded, and immature fish;

- The losses to the fishery due to the harvest of immature fish which are not able to add significant weight or to spawn before they are harvested;

- The loss of employment caused by the above;

- The cost to society (taxpayers) of the micromanagement and enforcement necessary to police the trawl fishery (which he believes greatly exceeds the cost of managing a longline fishery);

- The cost of bailing out companies and communities after stock collapses which come about through the acceleration of natural cycles by the overcapacity and overexploitation of fish stocks by trawlers;

- The cost of innumerable government studies, commissions, task forces, etc., to assist in management; and

- The high overhead costs that managment companies incur to control and administer their trawler fleets in

compliance with the growing web of regulations designed to implement micromanagement plans.

He concludes that if these costs were accurately measured and factored in, the true cost of landing a pound of fish with a trawler would be significantly higher than a pound of fish landed by a longliner. He argues that the "hidden" costs of operating trawl fleets are a worldwide problem - "There might have been a few lone voices out there, trying to highlight the problems with trawler technonogy, but they have been pushed to one side by the majority, myself included, who had only one desire and that was to catch more fish 'economically '". He observes that there have been three separate government studies into the state of the Atlantic groundfish fishery, all of which have failed to recognize that one of the major problems is the technology employed.

Mr. Matthews' "Blueprint for the Year 2000" contains, among others, the following recommendations:

a. There must be a significant phasing out of offshore trawlers, to be replaced by offshore longliners. Trawl technology would continue to be used to catch fish such as flatfish and shrimp which are not available to passive gear;

b. The groundfish plan must be amended to recognize that different fishing technologies have different impacts on the resource - and that these impacts should be taken into account in making allocations;

c. The fisheries managment process must be altered. The current consultative process favors trawl interests, and longline interests should be better represented. Management by "destructive consensus" must cease;

d. Regulations should encourage trawlers to switch to longline gear;

e. Longliners should be managed by hook size only; the hook size should make it probable that the fish will spawn at least twice prior to capture;

f. A special program should be developed to deal with the catching of northern cod. This will recognize the necessity of using trawl technology in the winter due to ice conditions on the grounds; research should be undertaken to study the effect of trawling during the spawning period; and

g. Cod should be managed by numbers of fish removed rather than by volume. An average size of 19" should be required, so that fish have an opportunity to spawn before being harvested.

Mr. Matthews closes his presentation by observing that the conservation problems caused by excessive use of trawl technology had been identified by a Royal Commission of Fisheries as early as 1928. He calls for the development of a fishery which gives prominence to the modern longliner.

8. INDEPENDENT REVIEW OF THE STATE OF THE NORTHERN COD STOCK, Dr. L. Harris, Communications Directorate, Department of Fisheries and Oceans, Ottowa, Ontario, Canada, February, 1990.

The Harris Commission, appointed to examine the status of northern cod stocks off the Atlantic coast of Canada and to make recommendations for its recovery and management, submitted its findings and recommendations to the Minister of Fisheries and Oceans in February of 1990.

The Commission found that the Atlantic cod grounds had been exploited since the 1480's, that the cod stocks had provided the economic foundation for settled communities in Newfoundland, Laborador, and Nova Scotia, and that overall the stocks had historically sustained the fishing pressure imposed upon them without exhibiting any obvious sign of decreasing abundance.

"By the middle of the twentieth century, however, new fishing technologies were being introduced at an increasingly rapid rate. Chief among them was the comparatively heavily powered vessel equipped with otter trawls that was capable of fishing in deeper waters than were heretofore accessible and of exploiting the large concentrations of fish that at the end of their autumn migrations were assembled for spawning in the outer shelf regions of the several offshore banks." Newly improved gillnetters also participated in this offshore fishery.

Later the modern factory trawler arrived. "Then came the burgeoning of offshore technology, with West Germany in the vanguard and other European nations quickly following and **the notorious assault upon the spawning aggregations on the northern banks** during the late 1960s and 1970s. With catches reaching 800,000 tons in the peak year of 1968, the predictable result was a collapse of the stock with inshore landings falling to figures lower than any recorded in the previous centuries." (Emphasis added. Note that since implementation of the Magnuson Act such uncontrolled exploitation has been preventable, and has not occurred off Alaska.)

In 1977 Canada declared a two hundred mile management zone, and adopted a management strategy aimed at rebuilding depleted stocks and establishing fishing strategies which would ensure their long-term viability. Ten years later it

became apparent that the strategy was not working. The Harris Commission found that scientists and managers had placed excessive faith in mathematical modelling techniques and short data series, and had failed to recognize the statistical inadequacies in their biomass assessments. These difficulties were compounded by the misreporting of catches, bycatches, and discard rates, and other significant inaccuracies in the commercial catch data.

After examining the siutation extensively and holding numerous public hearings to gather testimony, the Commission made management recommendations, including the following:

a. That fishing mortality imposed on northern cod stocks should be reduced;

b. That fishing mortalities imposed during the spawning period should be reduced through a combination of seasonal closures and catch reductions. (The Commission concluded that the state of current knowledge is such that it could not answer the question whether intense fishing on spawning cod populations disturbs either the mating behavior or the spawning success of the stocks, or leads to localized depletions - and that conservative management is required);

c. That for both biological and economic reasons the size selectivity of traps, trawls, gillnetts, and other gear types should be examined immediately to reduce the harvest and bycatch of cod less than six years of age; and

d. That fishing effort by large trawlers should be distributed among statistical areas to reflect the distribution of exploitable cod biomass.

<u>REPORT OF THE IMPLEMENTATION TASK FORCE ON NORTHERN COD</u>, E. B. Dunne, Fisheries and Oceans, October, 1990.

The Harris Commission's main recommendations on cod stock management (above) involved reducing the level of catch, restrictions on fishing activity during the spawning season, reducing the catch of small fish and ensuring offshore trawl effort is distributed over all components of the stock. An Implementation Task Force appointed to follow up on these recommendations reached the following conclusions:

a. That stock rebuilding must be started with an immediate, even if modest, reduction in catch;

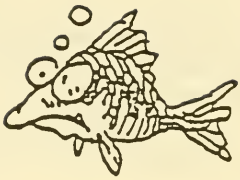
b. That directed fishing for northern cod should be prohibited during the peak spawning season;

c. That in order to protect small cod a minimum size should apply to trap-caught cod and the trap mesh should be

increased in size, that trawl meshes should be increased in size, that a minimum hook size should be established for hand lines and longlines, and that non-cod directed fisheries should be managed to eliminate the catch of small cod; and

d. That proportionate harvesting requirements by statistical area be maintained.

North
Pacific
Longline
Association



January 15, 1993

Membership
North Pacific Fishery Management Council
Scientific and Statistical Committee
Advisory Panel

RE: Hook Straightening, Longline Research, Autoline Videos

Dear Member:

Enclosed please find a cassette containing three videos on longlining. With the assistance of the NMFS Observer Program, the NPLA has distributed copies to all freezer-longliners operating off Alaska, and to their home offices. We are hopeful that you will have time to view it at your leisure, and to consider the information it conveys. The subjects are as follows:

I. Hook Straightening

The first video was made during the 1992 NMFS longline survey. It demonstrates the "hook straightening" technique included in the careful release regulation recently adopted by the Council. Note that the straightened hook simply pulls out of the fish as it entered, leaving only a small puncture wound. Most halibut caught on the modified circle hooks used on the autolining systems are hooked in the corner of the mouth, making removal easy. The hauling is done slowly at the beginning of the video, to demonstrate the straightening technique - towards the end, halibut are released at normal hauling speed. It is reported that it is easier to employ the technique at normal hauling speed. The recent pilot study by the Fisheries Research Institute found that deck exposure time is significant in halibut bycatch survival - note that carefully released halibut never reach the deck, and are out of the water for only a few seconds. Because the survey is on designated stations a variety of fish is taken, from deep and shallow water - black cod, true cod, rock fish, skates, arrowtooth flounder (I am advised that the halibut-like fish which floats away from the boat is a flounder). This portion of the video is silent.

4209 21st Avenue West, Suite 300, Seattle, Washington 98199
TEL: 206-282-4639; FAX: 206-282-4684

Enclosed also are two NPLA bulletins on careful release which were delivered to the vessels and to their home offices.

II. Longline Fishing and Research

This video, prepared by the Institute of Fisheries Technology Research in Bergen, Norway, demonstrates the techniques and advantages of a mature longline fishery. It discusses developments over the last fifteen years which have greatly increased the effectiveness of longlining, and ongoing research. It demonstrates the longline catching cycle; the function of bait; hook, gangion and swivel development; species and size selectivity. It offers insight into the concept of conservation-oriented fishing - species and size selectivity, fish quality, environmental impacts, energy conservation. It also makes the point that in Norway, the cod fishery is a winter fishery. The enclosed paper, **"Recent Developments in Longline Fishing -- Catching Performance and Conservation Aspects"**, reviews these issues and is well worth reading.

III. Mustad Autoline System

This video, prepared by Mustad of Norway, demonstrates the function of a modern autoline system. Mustad autoline systems are employed on most of the freezer-longliners working off Alaska.

Enclosed also is a copy of Council Document No. 13, **"Reducing the Incidental Catch of Prohibited Species in the Bering Sea Groundfish Fishery Through Gear Restrictions"**, reprinted as IPHC Technical Report No. 19, 1982. This document is also worth reviewing.

These materials illustrate the potential effectiveness of hook-and-line operations. As time passes we expect to improve our harvesting techniques so that we can harvest fish of the correct species and size, while minimizing bycatch and associted mortality.

We hope that these materials prove interesting, and that they will help you to appreciate the value of conservation-oriented fishing in this period of increasing environmental consciousness.

Sincerely,

Thorn

Thorn Smith

North
Pacific
Longline
Association

DATE: December 22, 1992

TO: ALL FREEZER-LONGLINERS

FROM: NPLA - Thorn Smith Thorn

SUBJECT: CAREFUL RELEASE OF HALIBUT - READ THIS!!!

PAGES: 1

STARTING JANUARY 1, 1993, ALL HOOK-AND-LINE HALIBUT BYCATCH MUST BE CAREFULLY RELEASED BEFORE COMING ABOARD THE VESSEL (UNLESS AN OBSERVER ASKS YOU TO BRING THEM ABOARD). THIS MEANS EACH AND EVERY HALIBUT, EVEN IF YOU HAVE TO STOP THE HAULER.

CAREFUL RELEASE MEANS:

1. CUT THE GANGION BEFORE THE HALIBUT HITS THE BOAT;

2. "SHAKE" THE HALIBUT BY GENTLY TWISTING THE HOOK OUT OF THE LIP WITH THE CURVE OF THE GAFF; OR

3. CAREFULLY RELEASE THE HALIBUT BY OTHER MEANS SUCH AS STRAIGHTENING THE HOOK (WE HAVE PROVIDED A VIDEO WHICH DEMONSTRATES THIS TECHNIQUE).

NEVER TREAT THE HALIBUT ROUGHLY, OR STICK THEM WITH THE GAFF OR ANY OTHER INSTRUMENT.

THE COUNCIL VOTED TO IMPLEMENT THIS REGULATION BY EMERGENCY RULE. THE LAST VESSEL CITED FOR "HORNING" HALIBUT WAS ASSESSED $25,000.

WE ARE LIMITED BY A STRICT HALIBUT BYCATCH MORTALITY CAP - WHEN WE REACH 825 MT, OUR COD FISHERY IN THE BSAI IS SHUT DOWN. WE WOULD HAVE BEEN SHUT DOWN SIX WEEKS EARLIER IN 1992 IF NMFS HAD THE BYCATCH CAPS IN PLACE. CAREFUL RELEASE OF HALIBUT WILL REDUCE OUR ASSUMED HALIBUT MORTALITY RATE, AND MAKE OUR CAP LAST LONGER.

PLEASE BE CERTAIN YOU RELEASE EACH AND EVERY HALIBUT CAREFULLY. CO-OPERATE WITH YOUR OBSERVER SO HE OR SHE WILL REPORT YOUR CAREFUL HANDLING. ASSIST THE OBSERVERS AS REQUESTED SO THEY CAN COLLECT DATA ON THE CONDITION AND SIZE OF FISH RELEASED.

OUR FISHERY AND OUR LIVELIHOODS DEPEND ON YOU!

4209 21st Avenue West, Suite 300, Seattle, Washington 98199
TEL: 206-282-4639; FAX: 206-282-4684

North
Pacific
Longline
Association

DATE: December 23, 1992

TO: All Freezer-Longliners

FROM: NPLA - Thorn Smith *Thorn*

SUBJECT: Careful Release Video

PAGES: 1

The NPLA has copied and will distribute the "careful halibut release" video made during the NMFS summer longline cruise. It demonstrates the hook straightening technique which is favored by the IPHC. You will see that the halibut suffers only a small exit wound when the hook is straightened.

The "hook straightening" portion of the video is silent. During the first part of the demonstration the hauling operation is slowed down or stopped, to show how the gaff engages and straightens the hook. Later the operation is performed at normal hauling speed - it is reportedly easier to straighten the hooks at normal speed.

The IPHC is very optimistic about this careful release procedure - they think we might be able to get our assumed mortality below 7% if everyone uses this technique. Whatever technique you decide to use - gangion cutting, shaking or hook straightening, please be sure that all halibut are carefully released before they come on board (unless the observer asks that they come on board - in which case we should co-operate while they collect condition and size data).

Above all, co-operate with your observer! He or she will record your handling techniques, which will translate into a mortality rate.

We have delivered "careful release" videos to the NMFS Observer Program. The observers will take a video to each freezer-longliner along with the attached announcement dated December 22. They will deliver the videos to the vessel's captain, and explain the program.

We have dubbed videos on Norwegian longline research and the Mustad Autoline system onto the tape, for your information.

PLEASE HELP MAKE THIS PROGRAM A SUCCESS!

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ISSN: 0579-3920

INTERNATIONAL PACIFIC HALIBUT COMMISSION

Established by a Convention Between
Canada and the United States of America

Technical Report No. 19

I. Reducing the Incidental Catch of Prohibited Species in the Bering Sea Groundfish Fishery Through Gear Restrictions

by

Vidar G. Wespestad, Stephen H. Hoag, and Renold Narita

Seattle, Washington
1982

ABSTRACT

The retention of several fully-utilized species (salmon, halibut, and crab) is prohibited in the Bering Sea groundfish fisheries. These prohibited species, however, are caught incidentally to groundfish, and the incidental catch reduces the yield available to the directed fisheries. The incidental catch of prohibited species is generally less with longlines or off-bottom trawls than with on-bottom trawls. Thus, one possible solution is to restrict the type of gear used in the groundfish fishery. This report examines the effect of restricting on-bottom trawls with respect to the production of groundfish as well as the catch of prohibited species. The results suggest that most of the available groundfish could be harvested with longlines and off-bottom trawls with a substantial reduction (over 80%) in the incidental catch of prohibited species. Allowing limited on-bottom trawling for flounders could minimize the loss of groundfish production and still provide for a reduction (over 60%) in the catch of prohibited species. Economic considerations were not examined, although the report recognizes that gear restrictions would likely increase the harvesting cost of some groundfish species.

I. Reducing the Incidental Catch of Prohibited Species in the Bering Sea Groundfish Fishery Through Gear Restrictions

by

Vidar G. Wespestad[1], Stephen H. Hoag[2], and Renold Narita[1]

INTRODUCTION

In the Bering Sea groundfish fisheries, the retention of salmon *(Onchorhynchus* spp.*)*, halibut *(Hippoglossus stenolepis)*, king crab *(Paralithodes* spp.*)*, and Tanner crab *(Chionoecetes* spp.*)* is prohibited. These species are essentially fully utilized in directed fisheries, and trawls (the primary gear used in the groundfish fisheries) tend to catch individuals of sub-optimal size. Also, most groundfish are harvested by foreign nationals whereas the directed fisheries are by United States nationals. Prohibiting retention is intended to eliminate any incentive to direct fishing effort on these species, all of which are of higher unit economic value than groundfish. Nevertheless, these species are caught incidentally and many die from injuries received during capture. This incidental catch not only reduces the yield available to the directed fisheries, but constitutes a conservation and management problem in that the catch is unspecified and difficult to estimate precisely. Hence, the incidental catch combined with the directed catch may result in excessive exploitation. This was apparently the case with halibut stocks in the 1960's and 1970's (Bell 1970, Skud 1973, Hoag 1976).

Hoag and Skud (1975) examined general management approaches to the problem of incidental catches in a multi-species fishery, and the North Pacific Fishery Management Council (unpublished)[3] has examined specific management options for the Bering Sea groundfish fishery. One of the options that could reduce incidental catches, while permitting harvesting of most groundfish species, is some form of gear restriction.

This report examines two possible management alternatives involving gear restrictions: (1) prohibit on-bottom trawls in all areas, i.e., groundfish will be harvested only with longlines and off-bottom trawls (trawls where the footrope of the net is not in contact with the bottom); (2) on-bottom gear will be allowed only in areas defined as yellowfin sole *(Limanda aspera)* or turbot *(Atheresthes stomias, Reinhardtius hippoglossoides)* grounds. These grounds would include the area of Bristol Bay shallower than 100 meters (yellowfin sole grounds) and the edge of the shelf deeper than 300 meters (turbot grounds). Off-bottom trawls or longline gear would be allowed in all areas.

Other management alternatives obviously could be examined. We chose Alternative (1) because it appeared to provide maximum protection for prohibited species and requires the greatest adjustment for the groundfish fisheries. Thus, Alternative (1) provides an upper limit to the potential benefits and costs of using off-bottom trawls and longlines to harvest groundfish. Alternative (2) is less restrictive and allows for harvesting fish which cannot be caught efficiently with off-bottom trawls.

[1] U.S. Department of Commerce, NOAA, National Marine Fisheries Service, Northwest and Alaska Fisheries Center, 2725 Montlake Blvd. East, Seattle, WA 98112.

[2] International Pacific Halibut Commission.

[3] Reducing the incidental catch of prohibited species by foreign groundfish fisheries in the Bering Sea, unpublished report, Working Group on Prohibited Species, North Pacific Fishery Management Council, January 1980.

In evaluating these alternatives, the effect of gear restrictions on the groundfish harvest was evaluated as well as the potential reductions in the catch of prohibited species. Data collected by U.S. observers aboard foreign fishing vessels during 1977-1979 were used in the evaluation. Catch rates for prohibited species (kg per mt of groundfish) were estimated for various gear types and target species, and these rates were projected to the estimated groundfish catch that would occur under the two alternatives. The economic implications of gear restrictions were not examined in this study.

TREATMENT OF DATA

To examine the question of the effectiveness of gear restrictions as a means of reducing the incidental catch of prohibited species, the 1977-1979 observer data files on catches of groundfish and prohibited species collected and maintained by the U.S. National Marine Fisheries Services were utilized. The organization and contents of these files have been presented by French et al. (1981).

Data in the observer files are recorded by individual hauls. Haul records were aggregated into five gear-target fishery categories:

(1) off-bottom trawl, pollock and other available species
(2) on-bottom trawl, yellowfin sole
(3) on-bottom trawl, turbot
(4) longline, Pacific cod *(Gadus macrocephalus)*
(5) longline, sablefish *(Anoplopoma fimbria)* and turbot

The average rate of incidence of halibut, salmon, Tanner crab and king crab in each category was estimated during 1977-1979 (Table 1). In reality, factors such as time, area, and depth also affect rates of incidence, and to some degree complicate the results. However, as discussed below, the five gear-target categories are generally distinct, and we consider the incidence rates in Table 1 to be indicative of the differences associated with each category. In any event, it is not possible to predict what changes might occur within each category if gear restrictions were instituted.

Table 1. Estimated catch rates (kg per m.t. of groundfish catch) for prohibited species by gear and target species in the Bering Sea.

	Prohibited Species Catch Rates			
Gear/Target Species	Halibut	Tanner Crab	King Crab	Salmon
Off-bottom trawl				
All available species	0.010	0.016	0.006	0.033
On-bottom trawl				
Yellowfin sole	0.499	6.861	0.517	0.020
Turbot	9.166	11.169	5.704	0.051
Longline				
Pacific cod	4.019*	0.000*	0.000*	0.010
Sablefish-turbot	1.503*	0.000*	0.000*	0.000

*Adjusted for an estimated survival of 75% for halibut and 100% for Tanner and king crab.

The pollock fishery is the largest in the Bering Sea, accounting for over 74% of the total groundfish catch (Bakkala et al. unpublished)[1]. The fishery is concentrated along the continental slope and most catches are made in depths between 100-200 m. Pollock are semi-demersal, occurring on- and off-bottom. Observers do not record whether individual hauls are on- or off-bottom hauls; however, observer reports note that Polish vessels exclusively utilize pelagic trawls and U.S.S.R. vessels generally fish off-bottom, while Japanese and Korean vessels trawl on-bottom. Observer reports also note that off-bottom hauls are almost entirely pollock. Therefore, to estimate the incidental catch rates of prohibited species in off-bottom trawls, data from Soviet and Polish hauls containing at least 98% pollock were utilized.

The yellowfin sole fishery occurs on the Bering Sea shelf in waters less than 100 m. Catch rates were based on hauls containing at least 50% yellowfin sole observed on Japanese motherships and U.S.S.R. large trawlers, the two vessel classes which account for most of the yellowfin sole catch.

A distinct deep water fishery occurs along the outer continental slope for turbot, which are fished primarily by Japanese small trawlers. Turbot are the major portion of the catch at depths over 300 m whereas pollock and Pacific cod are the primary species caught in shallower water.

Data from Japanese longlines were available separately for depths less than 500 m and depths greater than 500 m. Observer reports show that at depths less than 500 m the target species is Pacific cod, while at depths greater than 500 m sablefish is the target species.

All prohibited species captured in trawls were assumed to be dead, based on reports of observers aboard foreign vessels (U.S. National Marine Fisheries Service unpublished) and studies conducted by Hoag (1975). Observers on trawl vessels subjectively examine the condition of prohibited species in the catch. They report that nearly all of the salmon are dead when returned to the sea, that halibut viability ranges from 0-10%, and that many of those released alive are eaten by sea lions following the vessels. The survival rate of king and Tanner crab is uncertain, but a high percentage is noted to have crushed carapaces or severe appendage loss which indicates a very low probability of survival.

Catch rates for longline gear were adjusted for the following survival rates: 75% for halibut, 100% for Tanner and king crab, and 0% for salmon. These rates are approximations based on unpublished reports from U.S. observers on foreign vessels, joint U.S.-Japan longline surveys, and the International Pacific Halibut Commission.

ESTIMATED CATCH OF GROUNDFISH

In 1976, Canada, Japan, and the United States cooperated in a joint study to test a Japanese off-bottom trawl, designed to reduce the incidental catch of halibut (Pereyra et al. unpublished)[2]. The study involved four Japanese stern trawlers in the southeastern Bering Sea during January 1 through May 15. The vessels fished in pairs with one vessel

[1] Bakkala, R., V. Wespestad, L. Low, and J. Traynor. 1980. Condition of groundfish resources of the eastern Bering Sea and Aleutian Islands Region in 1980. (Document submitted to the annual meeting of the International North Pacific Fisheries Commission, Anchorage, Alaska, October 1980.) National Marine Fisheries Service, Northwest and Alaska Fisheries Center. 98 p.

[2] Pereyra, W., I. Ellis, S. Hoag, and S. J. Westrheim. 1976. Results of comparative testing of the Japanese off-bottom trawl designed to reduce the incidental catch of halibut. (Document submitted to the annual meeting of the International North Pacific Fisheries Commission, Tokyo, Japan, October 1976.) National Marine Fisheries Service, Northwest and Alaska Fisheries Center. 24 p.

using the experimental off-bottom trawl and the other acting as a control, using a standard on-bottom trawl. The experimental off-bottom trawl differed from the on-bottom trawl in the following manner: (1) the footrope was attached to a groundrope by 90 cm lengths of chain; (2) the groundrope was adjusted to position it directly under the footrope; and (3) floats were placed in two rows along the upper body of the net for greater buoyancy. Testing results indicated that the footrope would be about 70 cm above the bottom at a trawling speed of 3 knots.

The results from the comparative tests (Table 2) showed that groundfish catches in off-bottom trawls are equal to or greater than those in on-bottom trawls. The detailed species composition of the groundfish catch was not available, but the catch consisted primarily of pollock. The incidence rates of halibut observed were substantially lower in the off-bottom trawls, although the rates were greater than those shown in Table 1 because the experiment was conducted in an area which contains high densities of halibut and is not open to foreign trawl fisheries. Based on these findings and on the fact that Soviet and Polish vessels traditionally fish pollock with off-bottom trawls, we concluded that pollock can be fully harvested with off-bottom trawls.

Table 2. Results from comparative testing of a Japanese off-bottom trawl (from Pereyra et al. unpublished).

Trawl Type	January	February	March	April	May	Average[1]
			Number of Hauls			
On-Bottom	74	59	45	55	2	
Off-Bottom	98	81	56	75	11	
			Mean Weight of Halibut (kg)			
On-Bottom	2.26	1.40	1.98	1.93	1.56	1.89
Off-Bottom	3.33	1.75	1.74	1.91	2.09	2.18
			Incidence of Halibut (kg/mt Halibut)			
On-Bottom	1.40	3.43	7.35	1.77	0.97	3.64
Off-Bottom	0.74	0.78	2.29	1.52	1.19	1.48
			All-Species Catch Rate (mt per hour)[2]			
On-Bottom	10.2	8.6	7.6	8.6	1.7	8.8
Off-Bottom	12.8	9.0	7.7	8.3	7.0	9.5

[1] Unweighted average over months of January-April.
[2] Primarily pollock.

Comparative catch data are not available for other species, but squid *(Loligo* spp.*)*, Atka mackerel *(Pleurogrammus monopterygius)*, and rockfish *(Sebastes* spp.*)* probably can be at least partially harvested with off-bottom trawls because these species are often found off-bottom. Pacific cod tend to be close to the bottom, and probably cannot be fully harvested with off-bottom trawls. However, Pacific cod can be effectively taken with longline gear. Similarly, longlines could harvest sablefish and large flounders (primarily turbot).

Yellowfin sole and other flounders could not be harvested with either off-bottom trawls or longlines. To harvest these species would require allowing on-bottom trawls in at least limited areas or time periods such as suggested under Alternative (2).

The impact of gear restrictions on the groundfish harvest is difficult to predict because the catch rates and costs of fishing for some species with off-bottom trawls and longlines are unknown. Using 1977-1979 actual catches as a basis for comparison and assuming that off-bottom trawls and longlines are economically viable, we estimate that 12% of the total groundfish production, or 157,615 mt, would be lost under Alternative (1) (Table 3). Although some additional loss in production is likely because off-bottom trawls and

Table 3. Average catch (mt) of groundfish during 1977-1979 and the projected catch that might have occurred under the proposed management alternatives if off-bottom trawls and longlines are an economically viable method of harvesting.

Species	Average Catch 1977-1979	Gear	Projected Catch Alternative (1)	Projected Catch Alternative (2)
Pollock	966.692	Off-bottom trawl	966.692	966.692
Squid	8.262	Off-bottom trawl	8.262	8.262
Atka mackerel	23.745	Off-bottom trawl	23.745	23.745
Pacific ocean perch	8.350	Off-bottom trawl	8.350	8.350
Pacific cod - Trawl	37.733	Off-bottom trawl	20.682	20.682
- Longline	3.631	Longline	20.682	20.682
Sablefish	3.323	Longline	3.323	3.323
Yellowfin sole and other flounder	132.657	On-bottom trawl	0	132.657
Turbot - Trawl	47.901	On-bottom trawl	0	47.901
- Longline	2.014	Longline	24.958	2.014
Other	76.985	Off-bottom trawl	38.492	38.492
		Longline	38.492	38.492
Total	1,311.293		1,153.678	1,311.293

longlines probably are not efficient for some species. all available evidence suggests that pollock can be essentially fully harvested with off-bottom trawls. Therefore. an upper bound on the loss can be calculated by assuming that only pollock would be harvested under Alternative (1). Again using 1977-1979 catch data. the harvest would be 966.692 mt. and the loss would be 26%. 344.600 mt. The loss in groundfish production under Alternative (2) should be minimal because on-bottom trawling is allowed. A reduction in the catch of species such as Pacific ocean perch *(Sebastes alutus)* and Atka mackerel is possible but these species represent a relatively minor part of the total groundfish complex.

ESTIMATED SAVINGS OF PROHIBITED SPECIES

The catches of prohibited species that would occur under Alternatives (1) and (2) were estimated by extrapolating the catch rates from Table 1 to the projected groundfish catch in Table 3. The results by gear and target species are given in Table 4. The estimated catch was then compared to the observed catch (1977-1979 average). and the savings (difference) was calculated (Table 5).

Alternative (1) greatly reduced the catch of all prohibited species: halibut catches were reduced by about 92%. Tanner crab catches and king crab catches by 99%. and salmon catches by over 80%. Alternative (2) also reduced catches of prohibited species but the reductions were less than for Alternative (1). High incidental catches of halibut and crab were estimated for the on-bottom trawl fishery for turbot. and large catches of Tanner crab occurred in the yellowfin sole fishery.

A reduction in the allowable catch of yellowfin sole. other flounder. and turbot would. in turn. reduce the catch of prohibited species. For example. if the optimum yield of all flounder species were reduced by 50% under Alternative (2). the estimated catch (mt) of prohibited species would be:

Halibut	Tanner crab	King crab	Salmon
460	751	182	38

Table 4. The estimated catches of prohibited species by gear and target species under Alternatives (1) and (2).

Gear/Target Species	Prohibited Species Catch (m.t.)*			
	Halibut	Tanner Crab	King Crab	Salmon
		Alternative (1)		
Off-bottom trawl				
All available species	10.6	16.9	6.3	34.8
Longline				
Pacific cod	124.7	0.0	0.0	0.3
Sablefish-turbot-other species	100.4	0.0	0.0	0.0
Total	235.7	16.9	6.3	35.1
		Alternative (2)		
Off-bottom trawl				
All available species	10.6	16.9	6.3	34.8
On-bottom trawl				
Yellowfin sole and other flounders	66.2	910.2	68.6	2.7
Turbot	457.5	557.5	284.7	2.5
Longline				
Pacific cod	124.7	0.0	0.0	0.3
Sablefish and other species	62.9	0.0	0.0	0.0
Total	721.9	1,484.6	359.6	40.3

*Estimates are based on catch rates in Table 1 and projected groundfish catches in Table 3.

Table 5. Estimated savings of prohibited species under Alternatives (1) and (2), based on 1977-1979 data.

	Prohibited Species Catch (m.t.)			
	Halibut	Tanner Crab	King Crab	Salmon
Observed catch (m.t.)				
(1977-1979 average)	2,830	4,572	920	227
Alternative (1)				
Estimated catch	236	17	6	35
Estimated savings[1]	2,594	4,555	914	192
Alternative (2)				
Estimated catch	722	1,485	360	40
Estimated savings[1]	2,108	3,087	560	187

[1] Observed catch minus estimated catch.

CONCLUSIONS

An examination of catch data from 1977-1979 indicates that it is technically possible to substantially reduce the incidental catch of prohibited species in the Bering Sea while harvesting most of the available groundfish by restricting the type of gear used in the groundfish fishery. We recognize that precise rates of incidental catch will vary with the area and time of year fished and that the institution of restrictions could alter the manner in which the fishery is conducted and therefore the incidental catch that would occur. However, we doubt that these deviations would change the basic conclusions. A more serious concern is that gear restrictions would increase the cost of harvesting and could affect the economic viability of the fishery. Data are not currently available to fully address these aspects of gear restrictions, and further research is needed to assess the economics of the fishery and, in particular, the catchability of different groundfish species with longline and off-bottom trawls.

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RECENT DEVELOPMENTS IN LONGLINE FISHING -- CATCHING PERFORMANCE AND CONSERVATION ASPECTS

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Abstract

During the last fifteen years the effectiveness of longline fishing has been significantly increased. This is achieved both by increased effort through mechanized baiting and gear handling, and by improved catching performance of the gear.

This paper describes recent developments of longline gear, with respect to the different gear components: Hooks, gangions, swivels, mainline and bait.

The conservation aspects of longline compared with those of trawl gear are discussed.

Introduction

Longlining is a traditional fishing method all over the world. Although the rigging and methods of operation vary considerably, the longline is basically a very simple gear. However, the success of capture for longline gear depends on a complicated interaction between a series of biotic and abiotic factors (Olsen and Laevastu, 1983). The different aspects of longline fishing are reviewed by Skud and Hamley (1978) and Bjordal (1981a).

This paper focuses on the recent developments of the main longline gear parameters, and on different conservation aspects of longline compared with those of trawl gear.

The longline catching cycle

The basic unit of longline gear consists of a baited hook connected by a gangion to the mainline. In a longline operation, the baited hook is the main daily investment, with a fish of high commercial value as the desired payback. The period from when the hook leaves the fishing vessel until it is retrieved might be defined as the longline catching cycle, during which time the hook goes through four major stages: Shooting, sinking, in fishing position and retrieval.

Recent developments of longline gear

The longline is in general an inefficient gear, if gear efficiency is measured as success of capture relative to the number of fish actually attracted by the bait stimuli and number of fish attacking the bait (Fig 1).

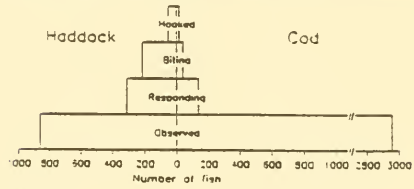

Figure 1
The behaviour of cod and haddock towards mackerel bait. Total number of observed fish and number of fish making a response, a bite or being hooked (from Løkkeborg et al. 1988).

Normal catch rates in the Norwegian longline fishery are from 5 to 30 fish (target species) per 100 hooks. Major reasons for this [illegible] low hooking probability, escapement of target species and hooking of non target species. Recent research and development work has, however, shown that the gear efficiency of longlines might be significantly improved by apparently minor changes of the different gear parameters.

Bait

A good longline bait should stay on the hook throughout the fishing period, during which it should effectively attract fish, either by chemical or visual stimuli, and by taste stimuli effectively entice the fish to ingest the baited hook.

The process of attracting fish by baits is not fully understood, although several authors have given valuable contributions within this field (Atema, 1980; Fernø et al, 1981; Carr, 1982; Sutterlin et al, 1982; Olsen and Laevastu, 1983; Anonymous, 1984; Løkkeborg, 1985). However the rather vast field of chemical sensing in fish and fish attraction by baits is beyond the scope of this paper. So, given that the chemical properties of the bait are adequate, the following discussion will be focused on bait loss.

The catching efficiency of longline gear is inversely correlated to bait loss. The problem of bait loss is described by several authors (Shepard et al, 1975; Skud and Hamley, 1978; High, 1980), and according to type of bait, soak time and fishing depth, bait loss may vary from 20-100%.

Bait loss for different reasons occurs during all stages of the catching cycle. During shooting of longlines, bait predation by sea birds might significantly reduce the number of effectively baited hooks. Although crowds of sea birds in the wake of longliners during shooting of the gear is the familiar situation, this has never been looked upon as a severe cause of bait loss.

This problem varies with respect to fishing ground, time of day and seasonally, and according to Løkkeborg (1987), such bait loss might be as high as 70% in extreme situations. Although little is known about the average bait predation by birds, the above investigation suggests that methods to prevent this type of bait loss might give a significant increase in catching efficiency.

Bait loss continues in the fishing position. For bottom set gear in particular, severe bait loss might be caused by different bait predators like hagfish, sea lice (different isopods and amphipods), decapod crustaceans, snails, sea cucumbers and starfish (authors observations). In addition bait loss is caused by fish, either target or non target species, that succeed in removing the bait without getting hooked. Due to bait loss, longline efficiency is thus gradually reduced during the three first stages of the catching cycle.

In some longline fisheries, a combination of bait is found to be more effective than either of the bait types used alone. Bjordal (1983a) found that the traditional bait combination of mackerel and squid in the longline fishery for tusk and ling was significantly more effective than pure mackerel or pure squid. Franco et al. (1987) got the same effect using a combination of mackerel and sardine bait in the longline fishery for hake. The reason for this effect might be that one of the bait types is more attractive, but physically weaker than the other, and will therefore disappear quicker from the hooks, while the stronger bait will prolong the effective fishing time of the gear.

Gangion floats have been used as a method to prevent bait predation by bottom scavengers. Bjordal (1984) found that gangion floats of 5 and 8 grams buoyancy reduced bait loss and improved the catching efficiency.

These gangion floats were, however, never accepted by the fishermen, because they made the gear handling more complicated.

Substantial effort is made to develop artificial baits for longlining (Bjordal, 1981a; Anonymous, 1984). So far this work has not lead to a bait with sufficient efficiency for commercial longlining. A recent development based on a synthetic bait developed at the University of Florida, has, however, given very promising results, with catch rates of cod equal to those of natural bait (Anonymous, 1988a). Further, this bait type gives only 5% bait loss (Løkkeborg and Bjordal, 1987).

Hook

The effectiveness of a longline hook is determined by a series of hook parameters, like sharpness of the point, barb width or strength. However, the hook size and general dimensions of the hook are regarded as the most important parameters for the catching efficiency.

A small hook has a higher hooking probability than a larger one, and a slight reduction in hook size will normally give higher catch rates (Bjordal, 1981b).

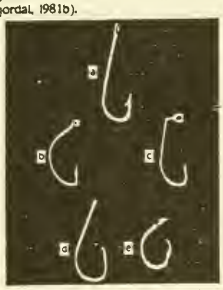

Figure 2
Traditional J-hook (a) and new hook designs: Wide Gap (b), Spurt/O'Shaugnessy (c), EZ-Baiter Circle (d) and Circle (e).

The most interesting developments are, however, on different new hook designs. At least in the western world, the J-hook (Fig 2) has been the traditional longline hook design for centuries. Development of more effective hook designs was initiated in the seventies through fundamental studies of fish hooking behaviour and longline field trials. Huse (1979) found that the catch rates of the Wide Gap and Spurt/O'Shaugnessy hooks (Fig 2) were superior to those of J-hooks in the order of 20-30% according to target species (cod, haddock, tusk and ling). Today these hook designs are dominant in the longline fisheries in northern Norway.

In the north American longline fisheries, the Circle hook (Fig 2) has proven to give significantly better catch rates, especially for halibut, but also for other species (Peeling and Rodgers, 1985). Compared with the traditional J-hook, the Circle hook is reported to give a 50-100% increase in catch rates of halibut, and this hook design is now used for halibut longlining in several countries. The circle hook is historically the traditional hook design in certain Pacific islands, and Johannes (1984) describes the catching principle of Circle or Rotating hooks (Fig 3).

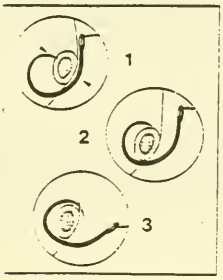

Figure 3
How a circle, or 'rotating' hook works. As the un-curved hook is pulled over the fish's jaw, the gape expands a little (and compresses the flesh on the jaw bone of the fish), and then snaps back into place once over the jaw, so the point acts like a one-way gate (from Johannes, 1984).

The most recent major hook development is the EZ-Baiter Circle hook (Fig 2), which is a hybrid design between the traditional J- and Circle hooks. Compared with traditional J-hooks, this new hook design has given 20-40% catch increase in comparative fishing trials for tusk, ling, cod and haddock (Skeide et al, 1986; Bjordal, 1987a,b), and it is now being used by several autoline vessels.

The increased catching power of the new hook designs, which all have incurved points or shanks bent towards the point, is believed to be caused by a combination of better hooking efficiency and lower probability of escapement after hooking. Characteristic for all the new hook designs is that they all give a higher proportion of fish caught by the mouth or jaw compared with the J-hook design.

Gangions

Experimental fishing has shown that the material and length of gangions have an effect on longline catch rates. Compared with multifilament, monofilament gangions give higher catch rates in the order of 10-20% in longlining for cod, haddock, tusk and ling (Bjordal, 1985a, b).

Within the range determined by the practical operation of longline gear, it has been shown that a reduced gangion length gives decreased catch rates. Karlsen (1976) obtained a significant decrease in catch rate of 28% for tusk and 17% for ling by shortening the gangion length from 40 to 15cm. This is explained by lower escapement from a hook on a long gangion, since this can take a lot more twist before it looses the elasticity.

Swivels

On monofilament gear, gangions are normally connected to the mainline by swivels, and the generally high effectiveness of monofilament gear can partly be explained by this feature. The swivel will to a large extent prevent the twisting of gangions, an the catch rates are improved by lower escapement of fish during retrieval of the gear.

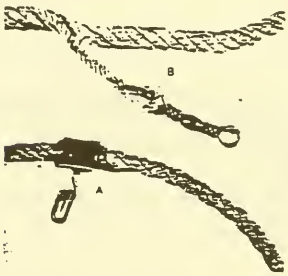

Figure 4
Examples of multifilament longlines with swivels. A) Two plane swivel (rotation around mainline and gangion axis). B) One plane swivel (rotation only around gangion axis). (From Bjordal 1988).

During the last years, different arrangements for swivel connection of gangions on multifilament gear have been develope (Fig 4). Testing in different fisheries (cod haddock, tusk and lin has shown that the swivel gives a catch increase of a minimum of 15% (Bjordal, 1985b, 1987c).

On traditional longline gear, two types of gangion twist occurs: Around the gangion axis, and around the mainline (Fig 5). Compared with traditional gear, both types of swivels give a significant reduction of 'gangion twist', while 'mainline twist' is only significantly reduced by the 'two plane swivel' (Bjordal, 1988).

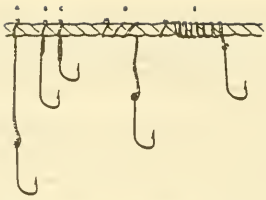

Figure 5
Gangion twist. A) Untwisted, B) and C) 'Gangion twist,' D) and E) 'Mainline twist.' (From Bjordal 1988).

Mainline

Several investigations have shown that the catching power of monofilament longlines is superior to those of multifilament gear (Karlsen, 1976; Husø and Karlsen, 1977; Hearn and Warren, 1980). This might partly be explained by the lower visibility of monofilament material, but also because the monofilament absorbs little bait odour, and the fish are therefore more efficiently guided to the baited hooks. There are also several other reasons for the high efficiency of monofilament gear. As mentioned above, swivels will partly increase the catching power of monofilament gear. Further, monofilament lines are thinner and are normally floated off the bottom. Movements by hooked fish will therefore more easily be transplanted to other parts of the gear, adding movement as an additional stimulant for fish attraction (Johannessen, 1983).

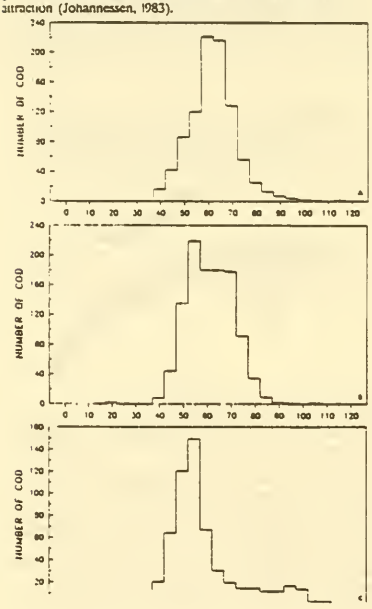

Figure 6
Length frequency distributions of cod caught by longline off northern Norway in three different periods: A) April 1987.

Selectivity of longlines

The longline is regarded as a size selective fishing gear. This is true to a certain extent. A longline will, however, catch fish over a fairly wide length range, but normally very few small fish. Figure 6 shows a typical length frequency distribution of cod caught by longline off northern Norway, where in these cases only 0.9-3.8% of the fish are under the legal size (42cm).

What is the most important factor for size selectivity of longline gear? McCracken (1963) and Sætersdal (1963) found that smaller hooks would select smaller fish. This is true to a certain extent, but in both these investigations the bait size was reduced with decreasing hook size. Through a comprehensive study Johannessen (1983) found that bait size had a much greater effect than hook size on the selective properties of longlines. A large fish will normally take both large and small baits, while a smaller fish will rather go for a small bait. A reduction in bait size will therefore give equal or increased catch rates, but a higher proportion of smaller fish (Bjordal, 1983b).

The information on species selectivity of different fishing gears is rather scarce. Table 1 is based on different Norwegian longline investigations, just to give an indication of the trash fish catch rates versus catch rates of the target species. The catch of non-commercial species will vary in different longline fisheries, but it is normally fairly low.

Table 1
Catch rates of target species and trash fish in bottom longlining.

	CATCH RATES (No of fish per 100 hooks)	
Main target species	Target species	Trash fish
Cod/haddock 1)	37.9	4.7
Cod/haddock 2)	16.6	1.2
Tusk/ling 3)	19.6	1.3

1) Løkkeborg (1985), 2) Bjordal (1988), 3) Bjordal (1987b)

Conservation aspects of trawl- and longline gear

Conservation oriented fishing

The following discussion on the conservation aspects of longline and trawl gear is based on different aspects:

a) The species and size selectivity of the gear.
b) Survival after escapement.
c) Fish quality.
d) Effects on environment (eg, bottom fauna).
e) Energy budget.

Ideally a conservation oriented fishing gear should effectively catch only target species of legal size and high quality at minimum energy costs, with no harmful effects on the environment. According to the aspects above, different methods of exploiting marine resources may be classified from little to highly conservative.

Selectivity

- Size selectivity

In trawling, selection takes place at different stages of the catching process, from the doors and sweeps to the codend. For small (undersized) fish, codend selection is most important. In principle, a certain mesh size should give a good size selection. Clogging of meshes (eg, by flatfish or rockfish) or large catches that stretch (close) the meshes, are factors that may give very poor selection properties.

As mentioned above, longline gear might also catch small fish, and the length frequency distributions of longline and trawl catches might be fairly similar when the proportion of small fish in the fishing area is low.

Compared with longline gear, the trawl is, however, a much more powerful tool for catching small or undersized fish. This is based on fundamental differences between the two gears regarding gear saturation, catching capacity and operational tactics.

Longline gear has a clearly defined level of gear saturation and catching capacity, defined as the daily catch in number of fish, which is limited upwards to the number of hooks operated per day. In Norwegian longlining this ranges from a few thousand to 30 to 40,000 hooks, according to vessel size. With normal catch rates, ranging from 10-30 fish per 100 hooks and thereof 5-10% undersized fish, the exploitation of fish under legal size by longline is bound to be moderate.

The fact that longline gear has a definite saturation level also affects the tactics of operation in a conservation oriented direction. The profit in longlining depends on a maximum yield or payback per invested hook, and it is inversely correlated to the number of small fish in the catches. With an increasing proportion of small or undersized fish in the longline catch, the catch value will eventually reach a break even level. The skipper then has the choice, either to stop fishing or move to fishing grounds with less small fish. In addition to gear selectivity, the skipper's choice of fishing grounds regarding the possibilities of catching large fish, is therefore an inherent mechanism in longlining towards exploitation of larger size groups of fish.

In comparison, trawl fishing has no definite level of gear saturation or catching capacity. As is the case for longlining, the profit in trawl fishing will also be reduced with an increasing proportion of small fish in the catches. There is, however, an important difference: as long as each haul produces adequate quantities of larger size groups for profitable fishing, there is no need to stop fishing or change fishing ground – even if there might be large quantities of small- and undersized fish in the catches. Unlike longlining, there is therefore no strong inherent mechanism in the operational tactics of trawling that prevents exploitation of young fish.

The information available on the proportion of undersized fish in different trawl- and longline fisheries is too scarce to make a good comparison between the two gears. However, one rough measurement of the non-conservative nature of trawl gear, is the closure of fishing grounds when the proportion of undersized fish in the trawl catches exceeds a certain level. This is frequently used as a method of regulation to protect young fish in the fishery for Arcto-Norwegian cod by trawl and seine net, but is never used for stationary gears like longline and gillnet.

To illustrate the relative catch of young fish taken by different gears, the fishery for Arcto-Norwegian cod makes a good example. Figure 7 shows the proportion of cod less than 45cm (de-headed) caught by trawl, seine net, longline and gillnet during the period 1978 to 1987. On average the trawl catches contained 19.4% small fish compared with 6.1% for longline (Table 2), which clearly indicate that longline is a more conservation oriented fishing method than trawling with respect to low exploitation of the younger fish groups. It should be noted that Figure 7 and Table 2 are only based on legally landed fish, and do not include undersized fish discarded at sea.

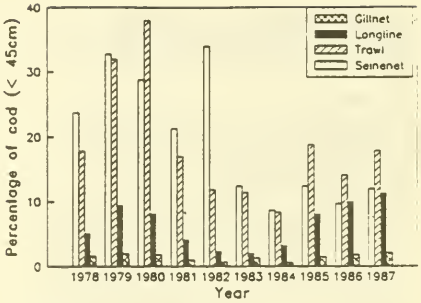

Figure 7

The proportion of cod less than 45cm (length, deheaded) for different fishing gears. (Based on landing statistics in northern Norway, from the Norwegian fishermen's sales organization.

Table 2

Catches of cod in northern Norway. Total catches of cod by different gears in northern Norway (1978-87) and the proportion of fish less than 45cm (length, deheaded). (Based on data from Norwegian Fishermen's Sales organization).

Type of gear	Total catch (tonnes)	< 45cm (tonnes)	< 45cm (%)
Trawl	399 419	77 304	19.4
Longline	178 667	10 853	6.1
Seine net	84 635	16 166	19.1
Gillnet	350 070	4 659	1.3

As shown in Figure 7, the difference between trawl and longline is reduced in the last part of the period. A possible explanation is a change in the migration pattern of the Arcto-Norwegian cod. Since 1982 the smaller size groups have migrated close to the shore, where they are less available to trawl gear, and mainly caught by longline and gillnet. Another reason might be the effect of closing of fishing grounds for trawling when the proportion of small fish exceeds 15%, which was first effectuated in 1984 (H E Olsen, Norw Fish Dir, pers comm).

- Species selectivity

As indicated in Table 1, longlines have good species selective properties, and non-commercial by-catch is normally modest. A trawl will in principle catch all fish in the swept volume, except those that are selected through the meshes. Large by-catches of different non-commercial species, particularly fish with high retention properties (eg, flatfish, rockfish) are therefore not uncommon in trawling.

Survival after escapement

Little information exists on the survival of fish after escapement from fishing gear, mainly due to lack of methodology for unbiased investigations within this field. However, this is a very important

aspect of conservation oriented fishing, and ongoing research will hopefully clarify mortality rates of fish after selection or escapement (Main and Sangster, 1988; Efanov and Istomin, 1988). At present, it is therefore difficult to evaluate the two gears with respect to this conservation aspect.

Fish quality

Both methods of capture may produce fish of high quality. However, big trawl hauls and hauls of long duration might lead to reduced quality, both because the fish are exposed to a high pressure in the codend, and because it might take too long before parts of the catch are processed.

This is no problem in longlining since most of the fish are alive until onboard-processing. However, some of the fish caught on longline are of reduced quality when landed on deck - mainly due to attack by scavengers as hagfish and sea lice. This is generally a small problem, but according to target species, fishing ground and fishing time, this form of quality reduction might be significant.

However, fish caught by longline are in general regarded to be of a better quality than trawl caught fish, although there is little relevant information on this subject to make a proper evaluation.

Ghost fishing

Ghost fishing, or fishing mortality caused by lost gear, is another important conservation aspect of fishing gears. This problem is most predominant for gillnets and traps or creels. For both trawl- and longline gear, ghost fishing is not regarded as a severe problem.

Negative effects on the environment

Ideally, a conservation oriented fishing method should not have destructive effects on the environment, like bottom topography and bottom fauna. Longline gear fulfils this requirement. Trawl gear might on the other hand have severe impact on the bottom environment. However, there is no available information regarding possible corresponding negative effects on the fish stocks (Anonymous, 1988b).

Energy conservation

Compared with trawling, longlining is regarded as a low energy fishing method. Endal (1979) found that longliners used from 0.075 (coastal) to 0.140 (deep water) litres of fuel per kg fish caught, while the corresponding value for trawling was 0.370. From a fuel saving point of view, longlining is therefore superior to trawling.

However, this comparison becomes somewhat different if the bait consumption of longlining is accounted for in the total energy budget of the two methods of capture. A normal bait/catch relation in Norwegian fisheries is at a 1:5 to a 1:10 ratio, eg, 0.1 to 0.2kg of bait are used to catch 1kg of fish. One way to look upon this is to subtract the bait consumption from the catch, which gives an average catch of 0.85kg per unit of fuel. If this is calibrated the longline fuel/catch ratio is raised to 0.088 to 0.165kg of fuel per kg of fish which is still far below the relative fuel consumption in trawling.

Conclusion

The longline is a relatively inefficient gear. Compared with other fishing gears it is also an ineffective catching method when fish are abundant, but a relatively effective gear at low fish densities and scattered fish distribution.

Mechanization of gear handling and hauling has increased the effort in longlining by 50-100% (number of hooks per vessel per day). Through different gear developments the catching efficiency is increased by the same order of magnitude. To further increase the catching power of longline gear, an important future challenge will be to develop new generations of automated longline systems, that can handle the most efficient gear.

In the comparison between longline and trawl gear with respect to conservation oriented effects, some aspects are fairly easy to evaluate based on existing data, while other aspects have to be judged more freely.

In Table 3, the different conservation oriented aspects are weighted as high, medium or low conservation oriented.

Table 3
Conservation oriented aspects of longline and trawl gear. H = high degree of conservation orientation, M = medium degree of conservanon orientation, L = low degree of conservation orientation.

	Longline	Trawl
Species selectivity	H	L
Size selectivity	H	L
Survival after escapement	M	M
Fish quality	H	M
Ghost fishing	H	H
Environmental impacts	H	L
Energy conservation	H	L

As indicated in the table, the longline must be evaluated as a conservation oriented gear, while trawling has a rather low conservation oriented effect.

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EFFECTS OF TRAWLING AND LONGLINING ON THE YIELD AND BIOMASS OF COD STOCKS - NUMERICALLY SIMULATED

by

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ABSTRACT

Numerical studies were conducted on the effects of trawl and longline catches on a cod stock and possible yields from it.

Five year mean age composition of Pacific cod (Gadus macrocephalus) from the Bering Sea was used as initial age composition of the stock, which was normalized to 1 ton. Age specific Z (total mortality) was computed from this distribution and natural mortality was derived by subtracting fishing mortality from Z. Age compositions of catches were either prescribed from empirical data or created with fishing mortality coefficient (F), which was assumed constant with age after the age of full recruitment. The computations were done with different catch levels for six years assuming average constant recruitment.

Essential results of this study are: a) The stock left in the sea decreases with increasing catch and reaches an equilibrium if recruitment and catches remain constant. With similar catch levels this equilibrium is reached earlier with longline and is higher than that of trawl. b) If a given level of stock in sea is desired, higher annual catches can be taken with longlines than with trawl. c) By the same catch size longlines remove more older and more piscivorous fish which is beneficial to recruitment if the latter is largely controlled by predation.

The above mentioned essential results indicate, among others that some longline fishing might be allowed to continue when TAC for trawlers has been reached.

FISHERIES MANAGEMENT APPROACHES TO LONGLINING AS VIEWED FROM THE NORWEGIAN AND ICELANDIC PERSPECTIVES

SUMMARY

As the result of extensive discussions with both managers and participants in the Norwegian and Icelandic cod fisheries, two dominant themes have emerged with regard to fisheries management strategies and the relationship of the longlining technique to these strategies. Each country has its own mix of social, political, economic, biological, and environmental considerations which influence the decisions of fisheries managers, but in each country there is one simple underlying theory about fish abundanc and one simple underlying objective about how to maximize fish stocks and the potential for harvest.

The theory is: Nature determines the initial strength of year classes--not management or fishing effort.

The management objective is: Preserve spawning stock by protecting small fish.

Note that the objective is not to protect spawning fish or spawning grounds, but to prevent the removal of younger sexually immature fish from the stocks. All other considerations are ultimately of minimal importance in the management strategy of these two countries.

Both countries have an extremely liberal approach to longliners. There are a number of reasons for this policy, such as the high quality of the landed product and the benign influence o the gear on the habitat, but the overiding consideration is that the technique is inherently size selective: longliners do not kill small fish--to avoid killing small fish is the fundamental management objective.

The findings for trawler-longliner catch characteristics for the New England region (based on Dr. Serchuck's data) as reported by Mr. Sheldon at the September 17, 1984 regional council meeting are directly in line with those of researchers in Norway and Iceland. The average cod caught by otter trawl, even with large mesh is less than four years old, weighs less than four pounds and has a fifty to seventy percent chance of having spawned. The average longline-caught cod is nearly seven years old, weighs over fifteen pounds, and has spawned at least twice. Comparisons of other fish characteristics and of other species, such as haddock, caught by the two methods are equally dramatic. The data from Norway, Iceland, and the New England area agree very closely and show the striking difference between the two fishing systems.

Furthermore, both Norway and Iceland have investigated the desirability of excluding longliners from spawning areas. In discussions with me representatives of both the scientific and management communities appeared surprised that there was any longer an

issue. In Norway there has been considerable research concerning the spawning process and the activites which might disturb it, including the development of theories about the influence of temperature, wave action, other organisms, and the presence of various forms of fishing gear. Their scientists have concluded that longliners using conventional #6 gear do not disturb spawning. There are no spawning areas closed to longliners in Norway.

In Iceland there is one area about twenty by thirty miles in size off the south coast which is closed to all fishing from March 20 to May 2. It is an area of heavy fish concentration. Strangely enough the area is closed as the result of a request by fishermen. The director of the Marine Research Institute told me flatly that there is no scientific or management reason for the closure and that closure was not initiated or actively supported by the Institute, which has responsibility and sweeping authority for such measures. With regard to spawning the director saw no objection to longliners catching spawning fish, and felt that any objection raised would be largely muted by the fact that fish ready to spawn are not inclined to feed and therefore will respond poorly to baited hooks. He further stated that from his point of view there is no reason to restrict longliners from any area at any time.

The positive attitude toward longliners results from an effort on the part of both countries to encourage the success of a fishing technique which is totally harmonious with their understanding of effective stock management and conservation.

BACKGROUND

The basis for the preceding summary of viewpoints can be better appreciated with the benefit of some understanding of the fishing industries of Norway and Iceland. Brief background information relevant to the cod and haddock fisheries follows.

NORWAY

Sources: Major sources include Mr. Tobin Foss, from the Ministry of Fisheries in Oslo, Mr. Arvid Hylen, head of the cod section at the Institute of Marine Research in Bergen, and several industry personnel, including Mr. R. Stave of the fishing vessels Bergholm and Per Senior, Mr. Per Homeseth of the fishing vessel Goir, and Mr. Jan Silden, representing the fishing vessel Keltic. Mr. Silden is also president of O. Mustad and Son(CAN) Ltd.

In broad generalization it can be said that Norway's fishery potentials and problems parallel those of the Canadian maritimes with which we are somewhat more familiar. Norway is relatively sparsely populated, with numerous small towns and villages scattered along the coastlines. Fishing is accordingly very important and many traditions and practices are deeply engrained. Income from fishing nonetheless is sometimes meager and government has been involved in numerous plans which have sometimes provided short term benefits at the expense of long term solutions to complicated problems.

Up until about fifteen years ago, especially in the northern sections of Norway, handlining, gillnetting, and longlining from boats in the 40' to 70' range were the dominant fishing methods. These vessels operated on haddock and pelagic fish in summer months and on cod from mid-October to the following June or July. About ten years ago large filleting plants were built along the coast and dragger fleets were constructed to fish the huge Barents Sea cod stocks. Several factory trawlers were constructed capable of freezing 3,000 metric tons of fillets per year. Unfortunately small fish were heavily targeted and the stocks were "scooped down" to the point where draggers in general, particularly with present quota and fish size regulations, are marginally economic at best. In the meantime the composition of the longline fleet has changed with the development of mechanization. The traditional 40-60' inshore fleet is about the same size as in previous years. The 60-90' size vessel is phasing out and the large, mechanized vessels in the 100' plus range, capable of fishing various stocks and species in widespread areas is increasing.

At present smaller handliners, gillnetters and longliners are surviving. Government takes a dim view of gillnetting because of poor fish quality. Most of the fish must be split, salted and sold to third world countries with uncertain markets and low prices. However, small boat fishermen prefer gillnetting because when fish school they can catch many more than with traditional tub trawls.

As yet efforts to develop rudimentary mechanical baiters for the smaller fleets have been relatively unsuccessful. The large processing factory vessels no longer operate in Norwegian waters. The processing plants along the coast in one way or another own or control the dragger fleets which were built to provide year-round supplies of product. Initially the system worked. After the unexpected depletion of stocks combination boats, capable of as many as four fishing techniques, were built in a continuing effort to supply a variety of products to the plants. These efforts soon were also unsuccessful, and most vessels reconverted to handle one or at most two techniques. The increasing mechanized longliner fleet does not solve the problems of the shoreside plants. These larger vessels operate on the Norwegian cod stocks in the colder six months, but then find it more profitable to fish ling and cusk (which the draggers cannot catch in commercial quantities) farther south on the coast, and in waters controlled by the British Islands, the Faroe Islands and Iceland.

In the midst of this situation the government is attempting to produce policies which will preserve and enhance both the fishing industry and the fish stocks.

Gillnetting, handlining, and tub trawling dominate the small vessel fleets. Increasing attempts to require and reward quality have discouraged gillnetting, but all three methods are given some measure of support. In general small otter trawlers are not allowed within four miles of the coast, medium vessels within six miles, and larger trawlers and factory vessels within twelve miles. Four or five areas outside twelve miles which have high concentrations of fish are also closed to trawlers. Some small areas, particularly aroud the Lofotan Islands, are divided such that gillnetters, longliners, and small Danish seiners each have exclusive access to certain portions. Handliners are allowed in when the other vessels are out of an area. In some cases the government even hires vessels to protect longlines and gillnets from draggers operating at night.

Otter trawlers are considered a very mixed blessing. On the one hand they were built to provide substantial year-round supplies of fish to coastal plants. A differentiated fleet is still encouraged for this reason. But the tendency of draggers to deplete schools of small fish has led to severe restrictions on them. Present quotas of about 800 tons on moderately large vessels makes many of them uneconomic. Similarly they are banned from numerous areas in order to protect both the fish stocks and other methods of fishing.

The fundamental management problem lies in the small size of fish caught by trawlers. A 135 millimeter(5.3") mesh regulation is in effect, with minimum fish sizes of 43 cm(16.9") for cod and 39 cm(15.35") for haddock. Government officials feel the size limits are too small, that the mesh size itself should be increase

to 155 millimeters(6.1"), and that the minimum size cod to match both the mesh size and the biologically appropriate limit should be 55 centimeters(21.65"). Politically, 155 mm mesh and 55 cm minimum fish limits cannot be enacted into law at present.

The substitute management measure is the closure to draggers of areas with small fish. When 15% by count of dragger cod catches in an area are smaller than 42 centimeters in length, the area is closed. For haddock the closure is triggered when 15% are less than 39 centimeters in length. Longliners and gillnetters can continue fishing in these closed areas.

Management of the "Norwegian" cod stocks is an international problem involving the USSR, Britain, West Germany, and Spain among others. The main responsibility rests with Norway and Russia. A normal year class is spawned in Norway, spends its first year or so in Russian waters and then migrates westward to Norway again. The development of catch restrictions has been gradual, with individual vessel quotas appearing only in the last several years. Longliners and gillnetters have been unrestricted until this year when, under severe pressure from Russia, these vessels have been given quotas as well. However, in practice the smaller longliners and gillnetters are still allowed to continue after their quotas are filled.

The management objective is to maintain a spawning stock of 500,000 tons. Unfortunately all year classes, due to natural causes, from 1976 through 1981 have been poor. The 1975 year class was very strong and total allowable catch limitations and severe closure measures on trawlers in 1979 have worked well to preserve the 1975 year class. Fortunately 1982, 1983 and 1984 classes have all been good, with at least one considered "rich". The general consensus is that cod abundance is on the increase and that, with continued protection of small fish, greatly increased catch rates will be possible in the near future.

Presently about 30% of the Norwegian fleet is composed of longliners, many of them small inshore boats. Lack of recent historical rights has prevented the new, large, mechanized longliners from receiving large cod quotas. However their flexibility allows them to operate efficiently while draggers with twice the codfish quotas cannot.

Recent trends in cod landings by various techniques is very informative. The following table is from The Fish and the Ocean, special issue number 1, 1984, published by the Norwegian Directorate of Fisheries. The article containing the table is entitled "Norwegian Arctic Cod and Coastal Cod North of 62°".

	Gillnets	Longliners	Handliners	Scottish and Danish Seines	Draggers
1977	125,000	44,000	59,000	39,000	165,000
1978	121,000	51,000	46,000	19,000	151,000
1979	101,000	41,000	30,000	19,000	132,000
1980	86,000	36,000	39,000	15,000	89,000
1981	120,000	64,000	36,000	20,000	74,000
1982	107,000	74,000	39,000	31,000	63,000

Note that all methods have declined except longlining, which has increased dramatically. The decline in dragger landings has been precipitous. In spite of obvious advantages and capabilities under certain conditions, dragging is becoming less and less desirable and economic given the requirements for effective fish production and stock management in Norwegian waters. On the other hand, the efficiency of mechanized longliners and the compatability of the technique with management objectives is resulting in their increase.

ICELAND

Sources: The principal sources of information about Iceland are Mr. Jakob Jakobsson, director of the Marine Research Institute in Reykjavik, and Mr. Gudni Thorsteinsson, a fishing gear expert and marine biologist at the Marine Research Institute.

In many respects the development of fishing fleets, related problems, and methods of solution in Iceland parallel the experience in Norway. Iceland is very heavily dependent on fishing for the health of her economy. As in Norway, the majority of the fishing is accomplished from numerous small ports ringing the coastline. There are approximately 800 decked boats in her fishing fleet, about 100 of which are stern trawlers, and another 100 of which fish most of the time with longlines. As many as 350-400 boats are engaged in longlining at some time of the year, but the majority of these are small vessels which also gillnet and are sometimes involved with other fishing techniques as well, for example, drift netting for herring or deep water shrimping. Longliners ring the island, but even the larger boats, ranging up to 100 feet in length are almost all tub trawlers relying on shoreside hand baiting. Only on the northwest coast will the longliners go offshore for trips up to a week in length. Even here most of them go only for two days(two sets) with the baiting done ashore. The initial introduction of autoliners to Iceland was not well received, partly due to equipment problems, partly due to fishermen's belief in the efficiency of hand baited hooks, and partly due to the proximity of good fishing grounds to the coastal ports, which

made hand baiting ashore reasonable. One of the main reasons, however, was a deadlock between owners, connected with the fish plants, and crews concerning equitable share arrangements on the more expensive and more efficient mechanized vessels. There are only three or four autoliners in all of Iceland. However, one of them is now doing extremely well and there are expectations that more vessels will be added.

As in Norway, the government attempts to encourage longliners because of the quality of fish landed and the conservation benefits of the technique. Also as in Norway, there is a preference among small boat owners to combine a considerable amount of gillnetting with their longlining. Gillnets(7" minimum mesh size) are expensive, but when the fish are densely schooled they are also very efficient. Furthermore when the spawning capelin come in late February and March the cod have much to eat and will not feed on baited hooks. Similarly in April when the cod themselves spawn they will not respond to hooks. Under these conditions gillnetters do well. On the other hand in autumn and early winter the fish are widely distributed and even trawlers will not do well. It is then that longlining is effective and popular. By covering long stretches of bottom with bait which draws fish from a considerable distance the longliners have excellent catches.

This present year is the first time Iceland has had quotas for individual boats. The boats can use any method they wish to catch their quotas and are also allowed to sell them. Part of the purpose of individual quotas is to avoid the frenzy of activity which normally accompanies a general quota. Reducing the intensity of the effort is intended to encourage better quality in the landed product. The result of this form of quota system appears thus far to be a 5-7% increase in the amount of fish landed in prime condition. The Marine Research Institute has also established quality grades and related price structures. All boats are now paid according to the grade of their fish. This measure clearly encourages better care of fish caught by any method and helps induce fishermen to favor hook fishing over gillnetting.

In general longliners and gillnetters are protected in ways similar to the Norwegian system, with special efforts to favor the longliners. In situations where gillnetters and longliners compete for the best grounds, some areas are open to longliners only, while others are divided between them and gillnetters. Similarly this year catches in January and February by longliners only, did not count against their annual quotas. Geographical limits on trawlers vary widely and are complicated due to the diverse makeup of Iceland's continental shelf, but in general draggers must operate offshore. These distance regulations are intended to protect both the inshore fish and other fishing methods.

The cod bio-mass in Icelandic waters stands at about 1,200,000 metric tons, well below the 2,000,000 metric tons of some years ago.

Biologists see recruitment, which has recently been poor, as determined by nature only. The initial size of year classes they understand as totally beyond the effects of fishing effort or management. 1976 was first thought to be a very strong year class, but for reasons unknown it did not mature in great numbers. Unfortunately 1979, 1981, 1982 and 1983 were poor year classes. Only 1980 in the recent series was reasonably good.

One major determinant of year class strengths is the effect of the cold East Greenland current and the Warm Gulf Stream. When the East Greenland current swings toward Iceland year classes tend to be poor. When part of the Gulf Stream swings around the north and west coasts, as it did in 1984, the year classes are much stronger. 1984 is expected to be a very strong year class.

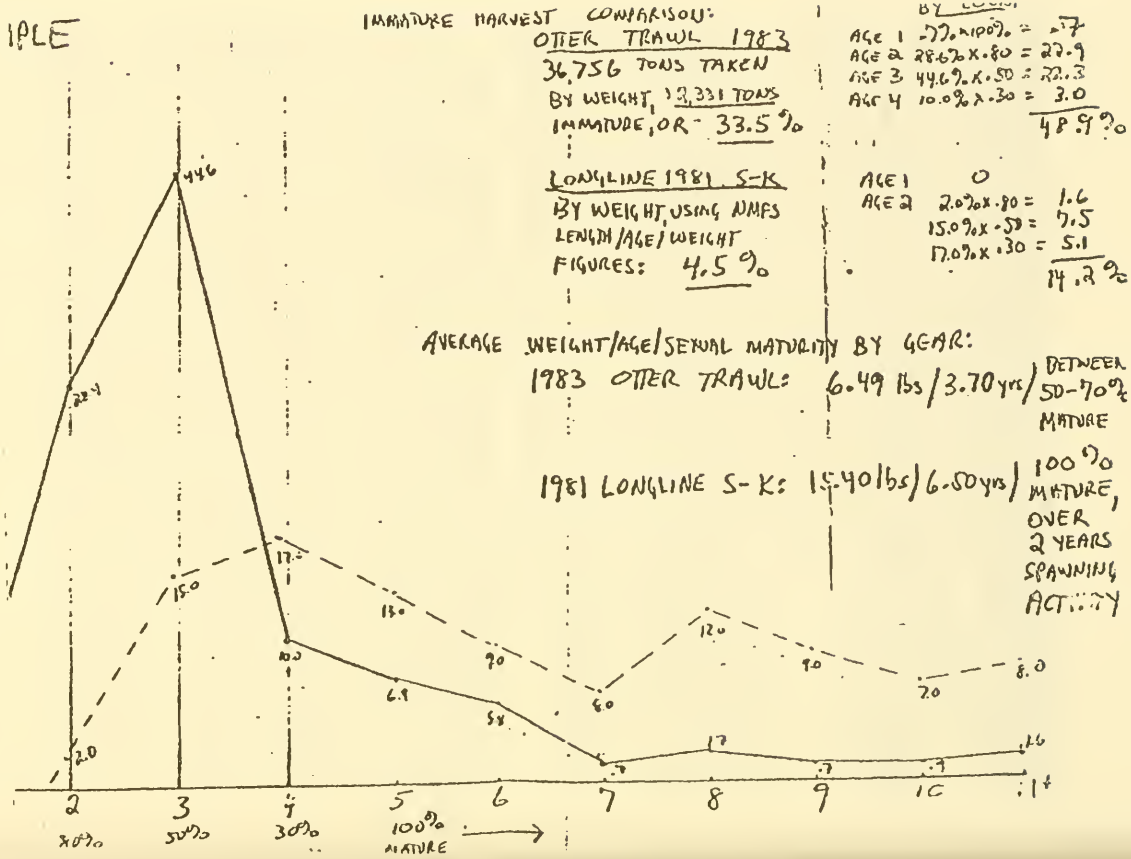
Such factors are beyond anyone's control. Thus Iceland's managers see their role as protecting the small fish which nature provides until they mature. Several measures are in effect to accomplish this end. First, there is a minimum mesh size of 155 millimeters(6.1") for trawlers. Second, there is a minimum fish size of 50 centimeters(19.69"). Of course smaller fish are caught. Therefore some fish between 45 and 50 centimeters are allowed to be landed and sold, on the assumption that they are killed anyway and that some value should be retained. Such fish are sold for reduced prices and generally go to a meal operation. Third, a major protection for small fish is provided by a system for closing areas to trawlers where heavy concentrations of immature fish are located. Large mesh is then considered inadequate protection.

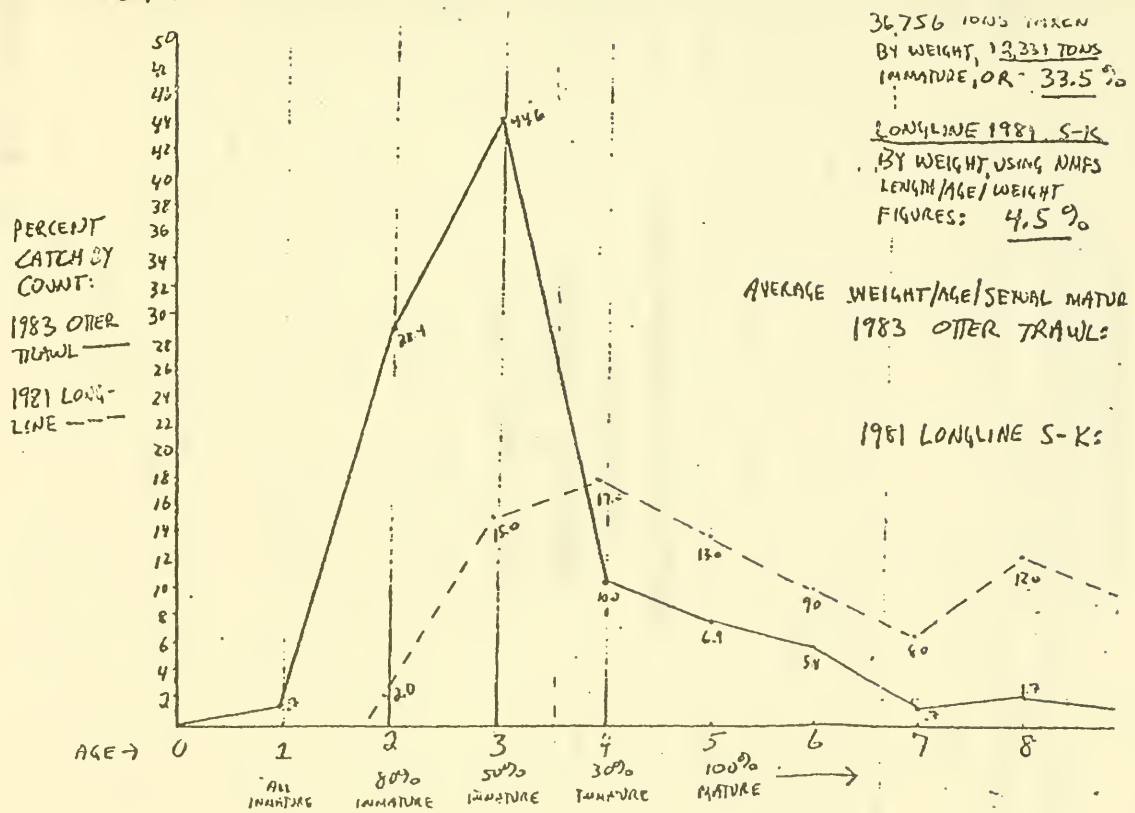
There are about 100 stern trawlers in Iceland. At any given time about eight of the trawlers at sea will have an observor aboard whose responsibility is to monitor the size fish being caught. If 35%, by count, of the fish are 55 centimeters(21.65") or less in length the area is immediately closed to stern trawlers, but left open to longlining and some other fishing methods. Someone is on duty every hour of the year at the Marine Fisheries Institute. When the observors determine the excess abundance of small fish and locate the general boundaries where they are found, a radio call is placed to the Institute. Whoever is on duty consults with the Director of the Institute and the area is closed, by radio, within one to two hours of the observor's first call. The coast guard is notified right away and the Ministry of Fisheries is notified the next day. The closed areas are reinspected frequently, normally about once a week, and reopened when the small fish leave. If the fish persist for more than two to three months, the continuing closure must be authorized by the Ministry of Fisheries, a process which takes two or three days.

In both Norway and Iceland considerable effort is expended to encourage longliners. Only minimal restrictions are put on them. In general they are allowed to fish whenever and wherever they want. No emphasis is placed on protecting spawning grounds or

other areas from longlines. However, substantial effort is placed on allowing small fish to mature with the help of restrictive mesh sizes on trawlers, minimum fish size regulations, and fast-acting, flexible but stringent measures to exclude draggers from areas where large numbers of juveniles are being caught.

These approaches are consistent with the theory that nature alone determines the initial strength of year classes and that the objective of good management is to allow juvenile fish to mature.


IPLE
IMMATURE HARVEST COMPARISON:
OTTER TRAWL 1983
36,756 TONS TAKEN
BY WEIGHT, 12,331 TONS
IMMATURE, OR 33.5%
LONGLINE 1981 S-K
BY WEIGHT USING NMFS
LENGTH/AGE/WEIGHT
FIGURES: 4.5%
BY LENGTH
AGE 1 27.7%x.80 = 22.1
AGE 2 28.6%x.80 = 22.9
AGE 3 44.6%x.50 = 22.3
AGE 4 10.0%x.30 = 3.0
48.9%
AGE 1 0
AGE 2 2.0%x.80 = 1.6
15.0%x.50 = 7.5
17.0%x.30 = 5.1
14.2%
AVERAGE WEIGHT/AGE/SEXUAL MATURITY BY GEAR:
1983 OTTER TRAWL: 6.49 lbs/3.70 yrs/ BETWEEN 50-70% MATURE
1981 LONGLINE S-K: 15.40 lbs/6.50 yrs/ 100% MATURE, OVER 2 YEARS SPAWNING ACTIVITY
44.6
22.4
15.0
2.0
17.0
13.0
10.0
9.0
6.9
5.8
6.0
12.0
9.0
7.0
8.0
1.7
1.7
1.7
1.6
2
3
4
5
6
7
8
9
10
11
50%
30%
100% MATURE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AVERAGE WEIGHT/AGE/SEXUAL MATUR
1983 OTTER TRAWL:
1981 LONGLINE S-K:
PERCENT CATCH BY COUNT:
1983 OTTER TRAWL ——
1981 LONGLINE - - -
AGE →
0
1
2
3
4
5
6
7
8
ALL IMMATURE
80% IMMATURE
50% IMMATURE
30% IMMATURE
100% MATURE
44.6
28.4
17.0
15.0
13.0
10.0
9.0
6.9
5.8
2.0
12.0

A BLUEPRINT FOR THE YEAR 2000

presented to

LONGLINING SYMPOSIUM

Halifax, Nova Scotia

Mr. Peter Matthews
November 14, 1990

A BLUEPRINT FOR THE YEAR 2000

When I was first asked to address you, I was told my subject would be "Costs of Longlining vs Trawling". I willingly agreed to do this because it appeared to be an interesting subject to explore.

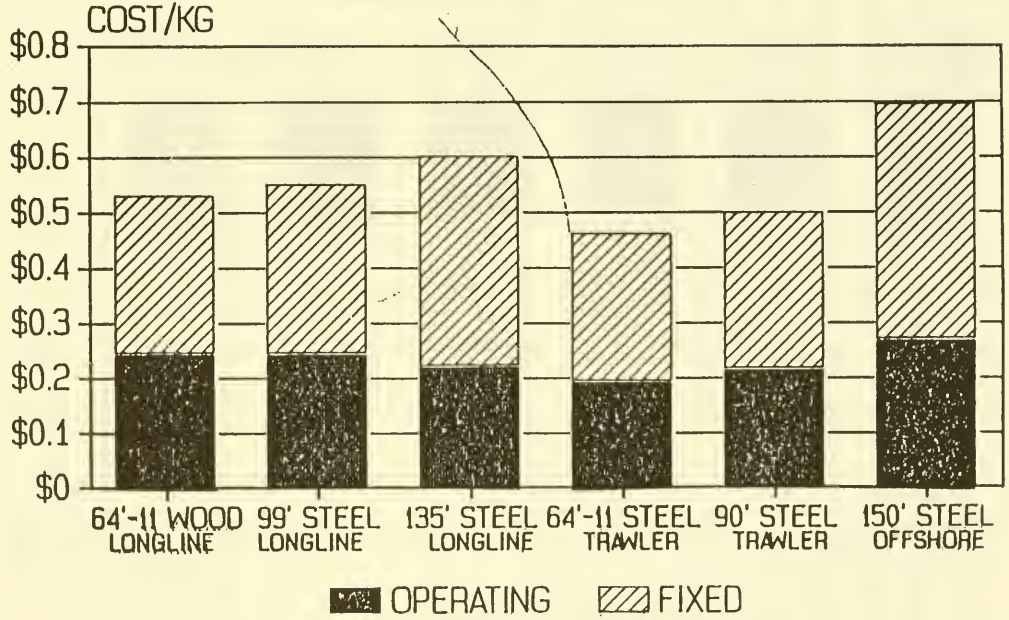
As my thoughts developed, however, it became apparent this was a far more complex subject than I had anticipated and I finally concluded the whole subject deserved a lot more thought and study than could possibly be given to it here. In fact, the relative economics of longlining and trawling would make an excellent subject for a business student's Master's thesis. Thus, in the time allotted, I propose I merely sketch out for you where I believe the Atlantic fishery should be headed over the next ten years and why I think longlining plays a key role in that future.

Many of you are no doubt familiar with some of the studies which have been done comparing the direct cost of operating trawlers with that of longliners. These studies have generally tried to demonstrate that gear, fuel and repair costs for a longliner are lower than for a trawler because longlining is a passive fishing method. From my past experience, operating a large fleet of conventional wetfish stern trawlers and from the current data I have from operating offshore longliners, added to by the generous co-operation of some inshore longliner and dragger fishermen who have shared their operating costs with me, I think I am in a good position to look at the true cost of operating various types of trawlers and longliners in Atlantic Canada. I would like to share this with you now.

TABLE 1
1990 VESSEL OPERATING COSTS
ASSUMING NEW VESSELS AND STOCK RECOVERY IN ALL AREAS.
CREW COSTS EXCLUDED

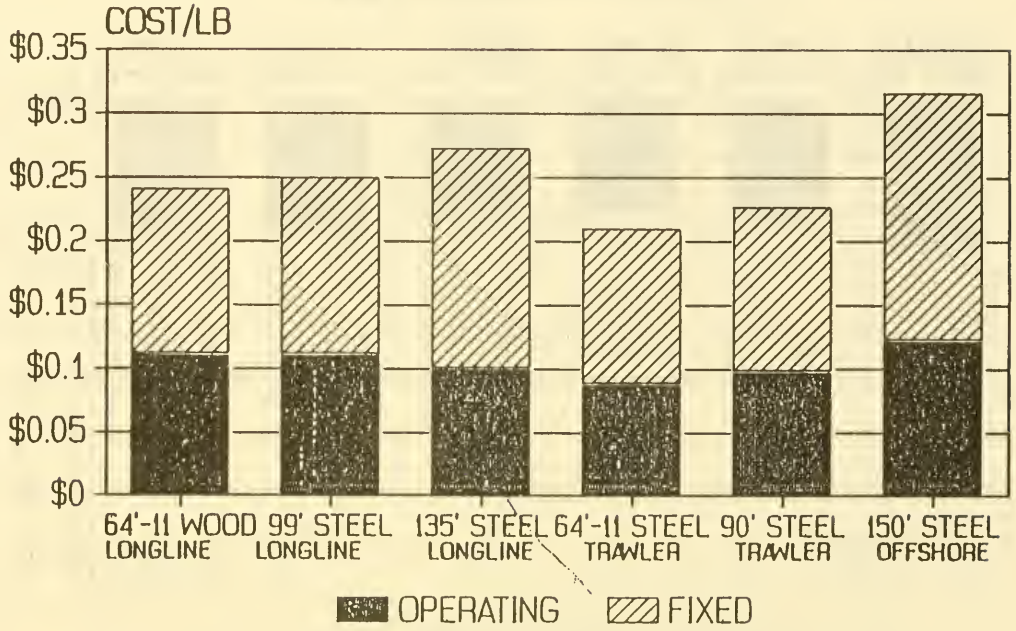
VESSSEL	64'-11 WOOD LONGLINER	99' STEEL LONGLINER	135' STEEL LONGLINER	64'-11STEEL TRAWLER	90' STEEL TRAWLER SCOTTISH SEINER	150' STEEL OFFSHORE STERN TRAWLER
ASSUMPTIONS:						
ANNUAL SEADAYS	170	260	270	210	250	270
ANNUAL CATCH/LB	1,250,000	4,000,000	5,000,000	2,500,000	4,500,000	8,500,000
ANNUAL CATCH/KG	567,000	1,815,000	2,269,000	1,134,000	2,042,000	3,857,000
FUEL COST/LTR	0.243	0.243	0.243	0.243	0.243	0.243
CAPITAL COSTS	800,000	2,900,000	4,500,000	1,500,000	3,000,000	8,600,000
OPERATING EXP						
FUEL & LUBE	29,000	104,000	124,000	90,000	150,000	376,000
GEAR	10,000	45,000	63,000	36,000	69,000	165,000
ICE	4,000	0	0	13,000	28,000	50,000
R&M +REFIT	28,000	140,000	145,000	50,000	145,000	375,000
BAIT & ICE	50,000	113,000	123,000	0	0	0
FOOD	8,000	37,000	40,000	16,000	30,000	58,000
MISCE	8,000	1,000	1,000	12,000	15,000	4,000
TOTAL OPERATING EXCLUDING CREW SHARE	137,000	440,000	496,000	217,000	437,000	1,028,000
FIXED:						
DEPRECIATION - OVER 20 YRS	40,000	145,000	225,000	75,000	150,000	430,000
INTEREST @12.5%	100,000	362,500	562,500	187,500	375,000	1,075,000
INSURANCE	24,000	52,500	81,000	45,000	60,000	155,000
TOTAL FIXED	164,000	560,000	868,500	307,500	585,000	1,660,000
TOTAL OPERATING & FIXED	301,000	1,000,000	1,364,500	524,500	1,022,000	2,688,000
COST/LB:						
OPERATING	0.110	0.110	0.099	0.087	0.097	0.121
FIXED	0.131	0.140	0.174	0.123	0.130	0.195
	0.241	0.250	0.273	0.210	0.227	0.316
COST/KG:						
OPERATING	0.242	0.242	0.219	0.191	0.214	0.267
FIXED	0.289	0.309	0.383	0.271	0.286	0.430
	0.531	0.551	0.602	0.462	0.500	0.697

TABLE 1A - 1990 VESSEL OPERATING COST/KG (EXCLUDING CREW COSTS)



Assuming new vessels and stock recovery all areas.

TABLE 1B - 1990 VESSEL OPERATING COST/LB (EXCLUDING CREW COSTS)



Assuming new vessels and stock recovery all areas.

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Table I compares the operating and fixed costs for three types of longliners and trawlers. In order to make a fair comparison of the economics of each type of vessel, I have assumed that:

1) The vessels fish from Nova Scotian ports on the Scotian Shelf, Grand Banks and Labrador grounds as appropriate for their size and fishing method;
2) All vessels are new and are treated in the same way for depreciation and interest;
3) The same price is charged for fuel using 1989 prices;
4) The stocks in all areas have recovered to reasonable levels so the vessels can go fishing to the best of their ability without constraints such as trip limits, etc.;
5) Fish, other than redfish, will be properly iced and gutted to land quality fish.

In other words, the intention is to arrive at the true cost of landing fish by allowing each vessel type to demonstrate its maximum fishing potential. Crew costs have been excluded to avoid distorting the figures as there are so many different ways of paying the crew. The bottom line, however, is that in all cases the crew must be paid for their labour, so excluding this cost will not distort the figures if what we are looking for is a comparison between vessel type with respect to catching costs.

Tables 1A and 1B show in bar graph form the cost of catching per kilogram and per pound for operating and fixed expenses. These tables put the data from Table 1 into bar graph form for easier comparison.

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These illustrate quite clearly that if straight operating and fixed expenses are the only factors to be considered then the most economical means of catching fish is with a 64'11" steel trawler at 21¢ per pound or a 90' steel trawler/Scottish seiner at 22.7¢ per pound. Both of these would normally be operated by an independent fisherman without any significant shore overhead costs.

At the other end of the scale, the 150 ft wetfish trawler is the most expensive vessel to operate by a very significant factor, at 31.6¢ per pound. You can see it has both higher operating and fixed costs. Not included in this cost breakdown for these big trawlers is the additional high cost of shore support systems and services they must have. There is little doubt it is a myth that the offshore wetfish trawler is an economic way of catching fish in the 1990s. Between these two cost extremes, the independent trawler and the large fleet-owned trawler, come the three longliners at 24.1¢, 25¢, and 27.3¢ per pound respectively.

To me the most interesting comparison is between the 99 foot steel longliner and the 90 foot combination trawler/Scottish seiner. The longliner fishes ten more days per year but catches a half million pounds (about 25%) less fish than the trawler. They both cost about the same to buy new, and about the same to operate each year. But, note, I have ignored any possible differences in revenue. These numbers only reflect the easily measured costs that we have traditionally used.

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Are there any other costs than these? I have begun to think so. More and more people are beginning to realize the presence of environmental costs and that these must be paid for and factored into the economic equation. In North America, for example, there is a growing movement that, "Those who pollute should have to pay". It is coming to be understood that economic prosperity and environmental quality are linked and mutually reinforcing. People are beginning to ask whether trawler fishing is turning the fishery into a non-renewable resource. In other words, has the widespread use of trawlers led us to the point where resource extraction exceeds regenerative capacity? While I don't think such questions are being asked in order to blame trawler fishing for declining stocks, I do believe that many people are beginning to believe that the type of fishing technology employed is a key factor in such declines.

As I thought about these things, I began to realize that an analysis of the true cost of catching fish must also incorporate environmental factors and could not be a function of operating costs alone. I was brought to this conclusion in part by my recent operating experience with longliners. These vessels consistently catch fish in the 20-30 lb range and often higher. This compares with 3-7 pound fish landed from trawlers. Thus, trawlers take three to seven times more individual fish than longliners with the resulting lost fishing opportunity from the fish that are not allowed to grow. This statistic has tremendous implications for fisheries management. Another startling statistic is that the discard rate from longliners is only .002, or, two tenths of

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one percent! Trawlers can't even dream of such results. These facts have led me to understand the dangers of being obsessed with the operating numbers and to be wary of:

"Not being able to see the wood for the trees".

Clearly, it has become essential to look at the true cost of trawling which none of the previous studies have done. As a proposal for further research, I submit the following costs should be quantified and included in the costs of catching fish:

a) The cost of fish tonnage lost due to the catching of and damage to immature fish. The lost tonnage is created in two ways. Immature fish are taken before they can add significant weight. Immature fish are taken before they can spawn to produce new fish.

b) The cost this lost tonnage creates for communities, fishermen and companies as plants shut down because of lack of quota.

c) The cost to the country and to all of us as tax-payers to fund the protection and enforcement required to police the trawler fishery, which, I believe can be shown to be more costly for government to manage than a longline fishery.

d) The cost to the country of bailing out companies and communities time after time because of stock collapses which came about through the worsening of natural cycles by the over-capacity and over-exploitation of fish stocks by the trawler.

e) The cost of innumerable government studies, commissions, task forces, and the like, to examine the problems affecting the fishery and to provide recommendations for change.

f) The high overhead cost that large companies incur to control and administer their trawler fleets in order to comply with the ever-increasing web of government regulations designed to ensure that micro-management plans are followed and enforced.

Ladies and gentlemen the list goes on and on! The problem is not confined to Atlantic Canada; it is a world-wide problem. Every country which has a major trawling industry has similar problems and costs. In Atlantic Canada, the hidden costs of operating trawlers probably add billions of dollars a decade to the fishing industry's bill to the nation's tax payers. For example, I am convinced that if these costs were accurately measured and allocated, the true cost of landing a pound of fish with that 90' combination trawler/seiner would be significantly higher than to land a pound with the 99' steel longliner. To my knowledge, however, these costs have never been studied in anything more than in the most superficial way. The time has come to do so. All of us, politicians, bureaucrats, industry leaders, both in the companies and those representing fishermen, have all been guilty of the cardinal sin of:

"Not being able to see the wood for the trees".

There might have been a few lone voices out there, trying to highlight the problems with trawler technology, but they have been pushed to one side by the majority, myself included, who had only one desire and that was to catch more fish, "economically".

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This has been particularly true since the introduction of the diesel engine to the trawler fleets of the world; for convenience lets say since the end of World War Two. In 1946, the oceans were teeming with fish. The supply was apparently endless and populations needed to be fed. The trawler was cheap to build, efficient, and nobody was really concerned about conservation or, if they even thought about it, it was someone else's problem. Most of us got caught up in the process of technological innovation, which dazzled us and made the trawler ever more efficient and ever more destructive with the result that, gradually over the past forty years, one fishery after another has collapsed. This has led to an endless cycle of crises in world fisheries followed by regulations designed to improve the local situation but which never did, such as fishery closures or cut backs to allow stocks to recover, so that we could start the cycle all over again. We must all have been mad! The fact of the matter is that, on a world wide basis, we were blind and never really stopped to look at the whole problem.

The tragedy is that here in Canada where we have prided ourselves in our fisheries management systems, we must now recognize that in the groundfish fishery we have failed totally. After fifteen years or so of highly expensive management to ensure stock recovery, almost all species of groundfish are in decline. The Kirby Task Force of 1982 did not identify there was a real problem with our resource management system. Industry leaders of the day were more focused on their share of the resource than management of the stocks or fishing technology. Even as recently

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as the past year, there have been three separate government studies into the state of the Atlantic groundfish fishery, all of which largely failed to recognize that one of the major problems with our fishery is that of fishing technology employed. Unfortunately, to a very large extent, the studies opted for the status quo. They recommended band-aid solutions such as altering a regulation here, adding another there, increasing mesh size again to try to deal with the problem of catching immature fish and so on. Such a piecemeal approach has never worked in the past and I can confidently say that it will not work in the future. We must address the root cause of the problem, which means curtailing the use of trawlers.

Longlining may have some faults and disadvantages, but it never has and never will lead to the collapse of whole fisheries, with the ensuing social costs this leaves in its wake. The simple reason for this is that longlining can be very easily controlled and only catches mature fish.

I discussed this problem with a very successful trawler Captain in preparation for this talk. He summed it up very well by saying:-

> 'Dragger fishing was fine for me, but it did not leave anything for my son'.

Please let me state here and now that I do not advocate a ban on trawling technology. To say that would be sheer nonsense as there are many fisheries where trawling, or the use of nets, is the most appropriate technology. How many flatfish, redfish or shrimp, to name but a few, would we catch using longlines or passive gear? Not too many.

What is needed is a balanced fishery where conservationist fishing tools are used to their full effect, so stocks can be fully exploited to the extent nature will allow us, so that they can be sustained year after year to leave a strong healthy fishery for our fishermen, their sons and their son's sons. I'm not saying this because I've suddenly turned "green". I'm saying it because getting the resource to long term sustainability is the only basis for a successful commercial fishery, and I'm in the fishing business.

The time is ripe for change. Most people realize that a change of direction of some sort is necessary in the fishery as the present arrangements are clearly not working. Since the early '60s the groundfish fishery has never generated any real wealth and has at best been a marginal employer, with repeated cycles of boom and bust, with very little boom.

Fortunately, we have a once in a lifetime opportunity to effect real change without undue hardship. The existing offshore wetfish stern trawler fleet is, to a large extent, old and will soon need replacement. Consequently, there is an opportunity to plan the catching technology that should be used in Atlantic Canada to take us into the 21st century. My hope is that we have people with vision who will look at the fishery objectively and not repeat the mistakes of the past by simply replacing the existing offshore groundfish trawler fleets with trawlers that are even more effective. This would result only in a repetition of the cycle of crisis after crisis, which has been our history. Everybody involved in the groundfish fishery has been affected by the

destructiveness of both the inshore and offshore trawler fleets. Consequently, I believe that with respect to plans for trawler fleet renewal, the decision is not one that should be made by the trawler operators alone. We all have a stake in the decisions for replacement of the offshore fleet. These decisions will ultimately affect everyone involved in the fishery. Similarly, many inshore fishermen have got to accept they must adopt other fishing methods which are less harmful to the stocks. Destructive fishing methods can no longer be tolerated from any operator. We are pushing Mother Nature to the limit; there may not be much "give" left in the system.

I wish to make a recommendation at this time and seek the support of this conference that:

> The Federal Government immediately set up a commission to study and make recommendations with respect to the most appropriate mix of fishing technology to be employed by the Atlantic groundfish fishery by the year 2000.

While a report like this should take only about a year to complete, I have chosen a ten year time frame to reach the objectives because a significant change in investment patterns is envisaged and this cannot happen over-night.

The objective of this commission, which I hope will be the last commission, should be to examine fisheries policy towards management and technology to achieve the following objectives:

1. A sustainable biomass
2. A sustainable catch (subject to natural cycles)
3. A sustainable return on investment

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4. Major de-regulation of fisheries management to make it cost effective and accountable
5. Management of each stock by individual fish removed rather than by tonnage, to the extent possible
6. A balance of harvesting technologies to provide the greatest economic return on a continuing basis.

Having called for the establishment of a commission to take us to a sustainable fishery by the turn of the century, I would like to present to you my blueprint for the year 2000. I believe this plan will allow us to achieve this.

My blueprint consists of twelve points:

1. There must be a significant phasing out of older offshore trawlers with their catching power replaced by offshore longliners of the type and design shown in Figure I.

   These are all-weather vessels designed for year-round operation and capable of achieving 270 sea days a year when wet-fishing and 300 sea days when freezing-at-sea. Truly, the modern longliner has come a long way since the days of the schooner or even the large wooden vessels which are still in use in Atlantic Canada today. They meet the delivery requirements of modern fish plants for year-round and consistent supplies of raw material to allow for production planning. Over the years, that was one of the main arguments put forward in support of the trawler and it was a very important one. Clearly, modern longliners now meet this criterion.

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2. Longliners of all sizes currently take about 10% of the cod resource while trawlers currently catch about 60% of all cod. I believe we should work towards reversing this relationship so that, by 2000, the longliner share of codfish is raised to 60%. This target should be reached by intermediate targets such as: 30% of all cod should be caught by longliners by 1995. Such targets could be enforced by the annual groundfish management plan which needs considerable overhauling. Various tools could be employed such as assigning all the growth in stocks to longline gear and giving longliners a less than proportionate reduction when stocks decline. Given that trawlers take three to seven times more individual fish out of the water per equal volume than longliners, it plainly does not make sense to share stock growth and decline proportionately.

3. The principles behind the current groundfish management plan were designed at a time when it was believed that stocks would recover and that it would be easy to satisfy social objectives over the long term. As a result, the principles in the plan largely reflect social objectives. For example, there is no statement or recognition in the current plan that differing fishing technologies impact on the resource differently and that this should be taken into account when making allocations. In this way, biological objectives are usually sacrificed for social objectives. The annual cumulative effect of this strategy is that now the biology is so weak that the social objectives can't be realized.

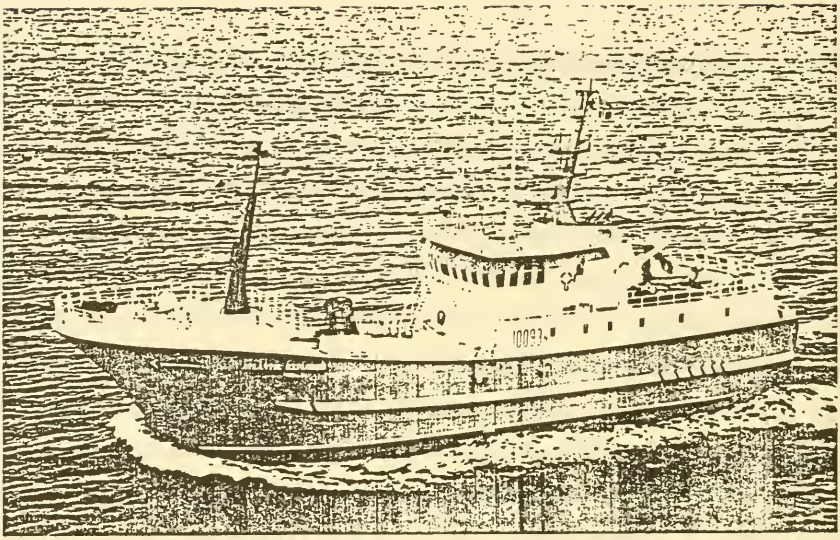

FIGURE I

M.V. "ATLANTIC EXPLORER"

BUILT 1988

SHELTER DECK
135 FT
LONGLINER

EQUIPPED FOR PRODUCTION OF 15 TONS/DAY FROZEN GROUNDFISH IN BLAST OR VERTICAL PLATE FREEZERS OR WET FISH IN PEN STOWAGE.

4. The processes by which fisheries management is decided must also be changed. Given that we try to manage by a consensus of industry sitting around a table, how can a sector which catches only 10% of the resource be heard let alone bring about change for the good of all? Answer: It must resort to conferences such as this. Seriously, however, we cannot continue to manage by destructive consensus. Did you know that longliners over 65 feet in Atlantic Canada have no formal representation on the committees which decide their allocations? There is no doubt that the consultative processes favour trawler interests.

5. Cod taken by longliner should be placed on allowance, rather than quota. This will have the advantage of encouraging trawlers to switch to the longline method voluntarily and effect a reduction in the catching of immature or juvenile fish. In fisheries managed by Enterprise Allocations (EAs), trawlers switching to longline will take fish with them into the allowance.

The apparent generosity to longliners in providing them a fishery not subject to quota closure only reflects the nature of longlining, which is to select for only the larger mature fish which have already spawned. There is thus no need to quota the fishery. Furthermore, our objective is to encourage longlining as a conservationist method of fishing.

6. Longliners will be managed by hook size only. A size of hook will be determined that will enable a high probability fish will spawn at least twice prior to capture.

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Encouragement of the adoption of longlining will have longterm benefits for fisheries managers. Resource removals by longliners are easily controlled because it is very difficult to cheat. Unlike mesh sizes, hook sizes can't be tampered with. A longliner can only haul so many hooks per day virtually regardless of engine size or line length. A dragger, however, can increase volume substantially with bigger engines and bigger nets. Thus, the size and capacity of draggers has become a big problem for fisheries managers which have tried to control them by mandating their inefficiency. This has needlessly driven up the costs of landed fish and made the industry less economic. The costs of landed fish from longliners do not have mandated inefficiencies built into them - or shouldn't have.

7. All vessels which opt to continue to use trawler technology shall do this under an EA program or individual boat quota.

From their Enterprise Allocation or quota it will be necessary for them to reserve sufficient cod by-catch to permit sensible exploitation of the other fisheries for pollock, flatfish and redfish, where the trawl or net is the only sensible fishing technology.

8. A special program should be developed to deal with the catching of northern cod. Specifically, this will recognize that trawler technology is necessary to capture these fish in winter due to ice conditions that prevail on the grounds. Research should be undertaken to study the effect of trawling during spawning.

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9. All banked licenses should be eliminated. These licenses have been banked largely since the declines of the mid 1980s. These declines came about in part because of the abundance of licenses and harvesting capacity. Reactivation of such licenses when stocks recover will only lead us back into declining fisheries.

10. The size of fish taken out of the water is a critical factor. As stated earlier, we should have, as an objective, the management of our fisheries by numbers of fish removed rather than by volume. With this in mind, it is not acceptable we should target 17" as the minimum size of cod fish for the simple reason fish usually have not reached spawning age when captured at 17". Our objective must be to ensure by the year 2000 that fish have spawned at least twice before capture. Initially, one spawning period may suffice. Consequently, it is recommended we should initially target an average size for cod fish of 19". We must recognize that fish in different stocks grow at different rates. While this must be taken into account in our management plans, we must settle on one, acceptable average size to the extent possible for ease of management and fleet flexibility.

Rather than use minimum size as the regulation, however, it is recommended we use an average size of 19". The recommendation for average rather than minimum size is one of practicality. The use of average size prevents the wasteful destruction of small fish. In addition, the difficulties with minimum size in measuring individual fish can be avoided. All

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that is needed is for a fisheries officer to take several samples of ten fish per sample. Each sample must add to 190" of fish. Average size is used in the scallop fishery as a major management tool because it is practical. Why not apply it to the groundfish fishery?

While more study is required about the impact of mesh size in specific areas, the basic objective should be that trawlers catching cod fish be given the choice in the immediate future of using either 140 mm square mesh or 155 mm diamond mesh for the cod-end with a move exclusively to square mesh once sensible operating experience has been obtained.

It is further recommended that rope bands on the cod-end be banned as these allow constriction of the mesh. Similarly, lengthening pieces in the cod-end must be eliminated. It will never be possible to prevent adjustments to the net to allow it to fish with restricted mesh size, but we might as well reduce the opportunities to do this.

11. The use of gillnets must be strictly controlled by mesh size to target larger sizes of fish. Areas fished and number of nets worked will be restricted. Nets will be required to be tended daily and selected use of degradable materials to reduce the harmful affects of ghost fishing will be enforced. It is not that gillnets are inherently bad; it is just that the fishing method has been abused in recent years in Atlantic Canada by use of bad operating practices. Specifically, however, gillnet fishing should not be encouraged at the expense of longlining.

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12. Fishing by foreign countries on our transboundary stocks is a continuing problem made worse by the fact they choose to ignore quota restrictions. This situation is compounded because we allow foreign fleets to use whatever technology they wish. We do this because we have yet to give formal recognition ourselves to the fact that choice of technology is just as important a factor in resource health as total removals. When we are able to recognize this fact domestically, we must impose it on our fishing neighbours. To the extent longliners relative to trawlers actually save fish, we may even be able to offer inducements to these countries to use longliners by expanding their quotas. With respect to transboundary stocks, we have a simple choice to make: either declare sovereignty to the edge of the continental shelf or address the problem through requiring changes in technology. Since Canada has no apparent will to expand jurisdiction, our choice is obvious. To this end, I propose that, by the year 2000, 60% of codfish caught by foreign fleets on NAFO and Canadian stocks be required to be caught by longliners.

As I close this presentation, I would like to point out that much of what I've said is not new.

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In the 1928 Royal Commission of Fisheries I find the following quote:

> the chief objections to steam-trawlers may be enumerated as follows: (1) that they destroy the spawn of cod and haddock, (2) that they destroy the feeding grounds of fish, with disastrous results, (3) that they take large quantities of immature and marketable fish, the result of which, with intensity of fishing, will be the inevitable depletion of the fishing grounds, (4) that they are responsible for over-production and the consequent glutting of the market.... and so on.

As you know, steam trawlers were allowed and these in turn gave way to diesel stern trawlers with sophisticated electronics which are today much more efficient than the trawlers of 1928. Trawlers then were the wave of the future and their development was irresistible. Unfortunately, we have reached the point where trawlers dominate the fishery to the detriment of even their own existence. It is ironic that we must now develop a fishery which gives prominence to the modern longliner so that trawlers can have a sustainable, albeit a reduced, fishery. It seems that the concerns about trawlers that were given to the 1928 Royal Commission have now come to pass. The difference is that this time we really must deal with them. We have no choice.

Thank you.

LIMITED ENTRY

AS A FISHERY MANAGEMENT TOOL

Proceedings of a National Conference to Consider Limited Entry as a Tool in Fishery Management

Denver
July 17-19, 1978

MORATORIA AND ALTERNATIVES

James O'Malley:

I hear many council members using the word "moratorium" and feeling fairly comfortable behind it. I would like to ask Mr. Burke or Mr. Mundt if this moratorium idea is just temporary, if it escapes any of the constitutional provisions, or if moratoria are in fact subject to the same restraints as a complete limited entry system.

Carl Mundt:

The legal analysis of a moratorium law is precisely the same, for practical reasons, as any limitation of entry.

• • • • • • •

Don Bevan:

Perhaps we could clear the air by recognizing that a moratorium is limited entry. It seems to me that it is difficult to argue that it is anything else. Although it is possible to recognize that limited entry is to a moratorium as proper medical treatment is to the doctor saying, take two aspirin and call me in the morning. But, as our lawyers have told us, a moratorium certainly has to go on exactly the same way as any limited entry scheme in which you are trying to take something away from someone. With regard to the probability of lifting a moratorium, I would certainly agree that the chances are very small. I would equate that with the probability of lifting the moratorium on homesteading in the oil fields of Oklahoma. That moratorium has been there for some time, and I think that the chances of lifting it are remote at the present time.

William Feinberg:

On a moratorium and limited entry being the same, I can only speak for myself, but our surf clam moratorium, in my opinion, is a temporary measure adopted to meet an emergent condition. It is not my intention—and I think that the other people on the Mid-Atlantic council will echo my sentiments—that this is going to be a permanent limited entry in any sense of the word. I am sure that if that concept were presented to us when this plan was originally devised, there would have been a different vote. The plan has a built-in, self-destruct clause of one year with a provision that the moratorium can be reviewed for an extension, and we have reviewed it. The moratorium definitely has given us problems. Jake Dykstra alluded to one, a geographical problem. We were concerned about the administrative and enforcement problems and other hardships that that would create. We decided that the lesser of two evils would be to have the moratorium in effect throughout the range of the surf clam.

"SELF-DESTRUCT CLAUSE OF ONE YEAR."

1978

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PROBLEMS OF THE MAGNUSON ACT

Problem 1 Harvesting Capacity in Excess of that required to harvest the available resource.

Problem 2 Allocation and preemption conflicts between and within industry sectors, such as with inshore and offshore components.

Problem 3 Preemption conflicts between gear types.

Problem 4 Gear conflicts within fisheries where there is overcrowding of fishing gear due to excessive participation and surplus fishing effort on limited grounds.

Problem 5 Dead-loss such as with ghost fishing by lost or discarded gear.

Problem 6 Bycatch loss of groundfish, crab, herring, salmon, and other non-target species, including bycatch which is not landed for regulatory reasons.

Problem 7 Economic loss and waste associated with discard mortality of target species harvested but not retained for economic reasons.

Problem 8 Concerns regarding vessel and crew safety which are often compromised in the race for fish.

Problem 9 Economic instability within various sectors of the fishing industry, and in fishing communities caused by short and unpredictable fishing seasons, or preemption which denies access to fisheries resources.

Problem 10 Inability to provide for a long-term, stable fisheries-based economy in small economically disadvantaged adjacent coastal communities.

Problem 11 Reduction in ability to provide a quality product to consumers at a competitive price, and thus maintain the competitiveness of seafood products from the EEZ off Alaska on the world market.

Problem 12 Possible impacts on marine mammals and seabirds, and marine habitat.

Problem 13 Inability to achieve long-term sustainable economic benefits to the nation.

Problem 14 A complex enforcement regimen for fishermen and management alike which inhibits the achievement of the Council's comprehensive goals.

Committee and Public Poll Comparing Alternatives and Problems

		PROBLEMS													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
Exclusive Registration	+	14	25	18	21	7	7	8	13	26	22	7	10	12	15
	–	33	22	29	26	40	40	39	34	21	25	40	37	35	32
Seasonal Allocations	+	18	18	19	14	9	22	20	20	22	14	27	38	19	14
	–	29	29	28	33	38	25	27	27	25	33	20	9	28	33
License Limitation	+	29	25	22	23	19	15	11	24	24	15	18	19	25	21
	–	18	22	25	24	28	32	37	23	23	32	29	28	22	26
Gear Allocations	+	13	23	37	18	21	22	19	12	22	11	16	27	16	9
	–	34	24	10	29	26	25	28	35	25	36	31	20	31	38
Inshore/Offshore	+	14	29	15	14	3	6	10	10	25	19	12	11	11	9
	–	33	18	32	33	44	41	37	37	22	28	35	36	36	38
CDQ Allocations	+	9	13	8	10	5	7	10	12	23	35	14	7	13	5
	–	38	34	39	37	42	40	37	35	24	12	33	40	34	42
Trip Limits	+	16	14	9	15	14	10	8	17	17	12	10	13	7	5
	–	31	33	38	32	33	37	39	30	30	35	37	34	40	42
IFQs for PSCs	+	26	24	24	20	15	36	19	23	27	14	23	22	27	16
	–	21	23	23	27	32	11	28	24	20	33	24	25	20	31
Non-Transferable IFQs	+	19	16	18	20	19	18	18	30	23	26	28	19	22	18
	–	28	31	29	27	28	29	29	17	24	21	19	28	25	29
Transferable IFQs	+	38	35	35	10	31	31	28	43	37	29	40	29	39	25
	–	9	12	12	37	16	16	19	4	10	18	7	18	8	22
Auctions	+	27	24	17	22	16	16	15	28	18	15	23	15	19	15
	–	20	23	30	25	31	31	34	19	29	32	24	32	28	32

A bioeconomic model of an age-structured groundfish resource exploited by a multi-year fishing fleet.

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R.N. O'Boyle, A.F. Sinclair and P.C.F. Hurley

O'Boyle, R.N., Sinclair, A.F., and Hurley, P.C.F. 1990. A bioeconomic model of an age-Structured groundfish resource exploited by a multi-Gear fishing fleet. Rapp. P.-V. Réun. Cons. int. Explor. Mer. XX: 000-000.

Abstract

A bioeconomic model of the Scotian Shelf groundfish fishery involving otter trawler and longliner fleets was constructed to examine the biological, economic, and regulatory consequences of the interaction of these two fleets. Otter trawlers catch younger fish than longliners and the revenue-cost pictures are very different. The model allowed examination of the long-term equilibrium levels and short-term transitory paths. The results of simulation indicated that both yield and employment were superior for longliners. However, otter trawlers, although experiencing higher operating costs, could "out-compete" longliners due to higher sustained catch rates and thus revenue per unit cost. From a regulatory point of view, it was determined that, under the assumptions of this study, the fishery could be managed by regulating only trawler activity. The longliner fleet could be left essentially unregulated since it is not economical for it to overfish the stock. The results of this study have significant implications for the management of multispecies, multi-gear fisheries in which differential age-effects of exploitation are present.

artment of Agriculture
Fisheries for Scotland

A Method for Testing the Effectiveness of Different Fishing Baits in the Sea

A D F Johnstone
A D Hawkins

Scottish Fisheries
Information Pamphlet
Number 3 1981
ISSN 0309 9105

A Method for Testing the Effectiveness of Different Fishing Baits in the Sea

A D F Johnstone and A D Hawkins

Marine Laboratory Aberdeen

Introduction

During the 19th century the most popular demersal fishing method in Scottish waters was the long line. By 1880, however, the trawl and steam trawler had been introduced to east coast grounds, and the beginning of the 20th century saw a decline in line fishing. The main advantage of the trawl over the long line was its greater efficiency in terms of catch per unit effort, ie more fish caught for the labour expended. Nevertheless line fishing has some advantages over more efficient methods. First, line caught fish are usually of much higher quality and command higher prices than net-caught ones. Secondly, lining is a more selective fishing method, and by alteration of the bait, the hook, or the line configuration different species or different sizes of fish can be caught and the capture of immature fish avoided. Also, with increasing fuel costs lining has become a much more attractive economic proposition, particularly since the method permits areas to be exploited which may be inaccessible to nets.

One of the key requirements for a resurgence of long line fishing is the improvement of its efficiency, in terms both of increasing the number of fish caught per unit effort (catching efficiency) and of adopting mechanical aides to help in baiting, shooting and hauling during fishing operations (handling efficiency). As part of a broadly based study of the ways of achieving improvement we have looked closely at the effectiveness of various baits. As early as 1890, Bateson published the results of an investigation of the senses of fish and commented on the supply of bait. We have been particularly concerned with looking for new forms of bait, as cheap as natural ones and just as effective at catching fish, but more suitable for use with an automatic baiting machine and more readily available.

Although comparative fishing under commercial operational conditions must be the ultimate test of the effectiveness of any new bait this method of testing has the severe disadvantage that it gives little information on the cause of differences in the fishing performance of the baits. Baits which are perfectly satisfactory when tested in the laboratory can perform badly at sea without giving any indication why they are so poor. We have therefore set out to evolve a method of testing baits in the sea which allows us to examine their different characteristics in detail.

Methods

The technique uses a television camera to observe fish attacking baits presented on a short length of line with two snoods attached (Fig. 1). The experiments were carried out during May to October in 1975 and 1976 in depths ranging from 12 m to 22 m at several sites in Upper Loch Torridon, Ross-shire.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northeast Region
One Blackburn Drive
Gloucester, MA 01930

February 25, 1992

CONFIDENTIAL

CLOSE HOLD

MEMORANDUM FOR: Richard Roe
Jon Rittgers

FROM: Ed MacLeod, Chairman Surf Clam/Quahog Review Committee

SUBJECT: Review of the Effectiveness of Our Administrative and Enforcement Obligations Under the Surf Clam/Quahog ITQ Plan

In addition to the comments and recommendations made in the attached individual reports, I personally would like to emphasize the following in executive summary:

1. It is apparent that each fishery has its own peculiarities and that each fishery that is being considered for an ITQ must have the amendment or plan suited to that particular fishery. This is a Council responsibility.

2. Although there may be a split in those harvesters that favor an ITQ system and those that oppose it, there is unanimity in their real fears of a monopolistic control of the fishery in the relatively near future. Monitoring should be provided by the Councils.

3.

4.

14. NOAA Counsel should notify the Council of NMFS procedures to be followed if allocations are seized.

15. Many complained that fishermen who used the federal/state line illegally to their advantage were rewarded in distribution of quota.

Attached you will find reports from the following individuals:

Exhibit 1: Bob Ross's summary on the interviews he conducted with the processor segment of the surf clam/quahog industry in the Mid Atlantic Region.

Exhibit 2: Ken Beal's summary on the interviews conducted by Ed MacLeod and him with boat owners, dock operators, captains and crew members in the surf clam/quahog fishery in Maryland and New Jersey.

Exhibit 3: Joel MacDonald's overview of the existing surf clam/quahog ITQ plan for a Counsel's perspective.

Exhibit 4: John McCarthy has presented an overview of the existing surf clam/quahog ITQ plan from a Law Enforcement Special Agent's perspective.

Exhibit 5: Combined comments from Myles Raizin, Policy Analyst, and Hannah Goodale, Resource Management Specialist, who are the NER staff personnel who have the responsibilities of monitoring the surf clam/quahog ITQ plan.

Exhibit 6: Dr. Stanley Wang's general comments on the ITQ plan from an economists perspective as well as a brief outline on this proposal for an economic review.

This report is in its final form. Members of the committee have reviewed the draft package that was submitted. Any substantial additions, deletions, or revisions were discussed and attended to in accordance with a majority concurrence. Minority opinions were discussed and proponents were notified that their comments would be included if they so desired.

Finally, members of the committee were notified that this report is to be treated as an "eyes only," "inhouse" report. It is not for public distribution or discussion without the consent of the Regional Director.

I, also, would like to extend my sincere gratitude to the active members of the committee for giving me the utmost cooperation in fulfilling the request of the Regional Director in a timely manner while fulfilling their other job responsibilities.

We are most grateful to the Port Agents who did a commendable job in lining up the schedule and interviews. We assured those harvesters interviewed that no names would be mentioned in filing our reports. We can state emphatically that they talked openly, and periodically vented their anger. It was difficult, if not impossible to keep the conversation confined strictly to the tagging system and enforcement as you can see from our reports.

Submitted on behalf of the Review Committee:

By Edward J. MacLeod
Edward J. MacLeod, Chairman

EAST COAST FISHERIES FOUNDATION, INC.

July 16, 1992 VIA FAX

Mr. Richard Roe
Regional Director
National Marine Fisheries Service
One Blackburn Drive
Gloucester MA 01930

Dear Dick:

This is a request under the Freedom of Information Act.

I wish to obtain copies of all documents pertaining to the ownership or "property right" interest in the Atlantic Surf Clam industry during the period 1987-1992.

This request includes, but is not limited to, all documents, reports, memoranda, notes, tape recordings, charts, graphs and other information in writing, on tape, or electronic media (including floppy disks) resulting from a survey undertaken by your office and conducted by Ed MacLeod, Bob Ross, and Ken Beal in January and February of 1992.

If, for any reason, this request cannot be met, please explain in detail why this is the case.

Sincerely,

Jim O'Malley

James D. O'Malley
Executive Director

JOM/se

P.O. Box 649 • Narragansett, RI 02882 • (401) 364-9814

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
1335 East-West Highway
Silver Spring, MD 20910
OFFICE OF THE DIRECTOR

AUG 17 1992

Mr. James D. O'Malley
Executive Director
East Coast Fisheries Foundation, Inc.
P.O. Box 649
Narragansett, Rhode Island 02882

Dear Mr. O'Malley:

This is in response to your Freedom of Information Act (FOIA) request via fax of July 16, 1992, received by the Regional Director on that date, requesting all documents pertaining to the ownership or "property right" in the Atlantic surf clam industry during the period 1987-1992, including a survey conducted by Edward MacLeod, Bob Ross, and Ken Beal in January and February of 1992. I interpret the first part of your request to mean that you are requesting a copy of the names of all allocation holders together with the amount of allocation held by each.

I regret to inform you that I must partially deny your request. The reports made relative to the survey you requested contain predecisional communications that were part of a deliberative process to evaluate the agency's administration of the individual transferrable quota system implemented as Amendment 8 to the Fishery Management Plan for the Atlantic Surf Clam and Ocean Quahog Fishery. This material may be withheld, pursuant to 5 U.S.C. Section 552 (b)(5). This provision protects the quality of the agency's decision-making process that fosters open and frank discussions. The documents to which this exemption applies are a three-page memorandum from Edward MacLeod to Richard Roe dated February 25, 1992, and the documents identified as exhibits include: a twelve-page report by Bob Ross; a five-page report from Kenneth L. Beal; a two-page report from Joel G. MacDonald [also exempted under the attorney/client privilege]; a six-page report by John J. McCarthy; a two-page report from Hannah Goodale and Myles Raizin; and a two-page report by Stanley Wang.

The remainder of the information requested regarding allocation holders and the factual information in the documents identified above is releasable and will be forwarded by separate memorandum from the Northeast Region.

THE ASSISTANT ADMINISTRATOR
FOR FISHERIES

You may appeal this partial denial within 30 calendar days after the date of this letter. Please address your written appeal to the General Counsel, U.S. Department of Commerce, Room 5883, 14th and Constitution Avenue, N.W., Washington, D.C. 20230. Both the envelope and appeal letter should be clearly marked "FREEDOM OF INFORMATION APPEAL." Your appeal should explain why you believe the requested records should be made available under FOIA and why you believe the denial to be in error. You must include a copy of your initial request and a copy of this response with your appeal.

Sincerely,

William W. Fox, Jr.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northeast Region
One Blackburn Drive
Gloucester MA 01930

September 3, 1992

James D. O'Malley
East Coast Fisheries Foundation
P. O. Box 649
Narragansett, RI 02882

RE: FOIA Request No. 282

Dear Mr. O'Malley:

Enclosed please find copies of the information we are authorized to release, referred to in the August 17, 1992 letter to you from William W. Fox, Jr. This information includes a complete set of allocation holders and the amounts of surf clam and ocean quahog quota they now hold, as requested by you in your letter of July 16, 1992 to Mr. Richard Roe.

If you have any further questions regarding your Freedom of Information Act request, please contact Myles Raizin at (508) 281-9104.

Sincerely,

Jon C. Rittgers
FOIA Officer

Enclosures

EXHIBIT 1

SUMMARY: SURF CLAM ITQ IMPLEMENTATION-PROCESSOR EVALUATION.

by

Bob Ross, F/NEO Fisheries Analysis Division

Amendment #8 to the Surf Clam/Ocean Quahog Fishery Management Plan (FMP) included the first implementation of an Individual Transferable Quota (ITQ) system under the Magnuson Act. The ITQ can be fished, sold, bought, leased, given or held by the designated allocation holder. The following report is an attempt to represent issues from the viewpoint of processors actively involved in the surf clam FMP.

>>MONOPOLY ISSUES: Real concern that one major firm will acquire a controlling percentage of the allocations (GCNE).

>>PROCESSOR LOGS: Most processors did not have problems with logs. [redacted]

>>TAGS: Most processors did not have problems with tag breakage.
>Tag breakage was reported at 2-5%. [redacted]

>>FOREIGN OWNERSHIP: Some processors are worried about a well financed effort to gain control of allocations. [redacted]

>>VESSEL CALL-IN: Most processors objected to pre-departure call-in requirements for greater inventory control and safety reasons. [redacted]

>>MINIMUM SIZE REGULATION: Most processors felt the end-user market demanded larger clams and with unlimited fishing time, vessels can target beds with larger clams and larger yields, so the minimum size is no longer an issue.

>>REDISTRIBUTION OF SEIZED ALLOCATIONS: Allocations can be seized by government agencies for MFCMA violations or non-fisheries related seizures like bankruptcies or drug related activities where allocations were ill-gotten gains from laundered monies.
>Processors would like to know the NMFS procedures if allocations are seized.

assets.

-vessel owners without allocations are turning into company boats to meet payments.

ALLOCATION - USE IT OR LOSE IT:

-The majority of the processors feel strongly that the allocations holders should be required to fish or otherwise use their resource allocation.

-Processors want some appeal mechanism to ensure that allocations which were not used for justifiable reasons are not revoked. The allocation may not be harvested for market reasons, i.e. if consumer sales are off or if inventories are high. If a vessel owner has vessel repairs, or other unforeseen problems, he should not lose allocations.

VIOLATIONS/ILLEGAL ACTIVITIES:

No processors indicated any enforcement irregularities in their own plant, but often they were willing to provide potential scenarios of violations by other processors.

Processors felt that violations were common but had decreased from earlier times when effort limitations were in place and potential allocation numbers were being established.

NON-TAGGED CAGES:
-The most likely location for using non-tagged cages would be in areas where the processor has a dock and processing plant at the same location.
-Processors have mentioned situations where 2 tags were found on cages,

-One individual mentioned a practice of only tagging the last 4 cages in a tractor-trailer truck capable of holding 14-16 cages/load to pass in-transit spot checks of loaded trucks by enforcement agents.

NON-REPORTED LANDINGS:
-Several processors had current NMFS FOIA data on the clam industry and questioned the NMFS records. Not all vessels known by processors to be fishing in a given time frame were identified as fishing on the NMFS records, which indicated not all tags were being reported.

INSHORE VS OFFSHORE HARVESTS:
This practice involves the use of state issued clam tags to harvest clams found in waters under federal jurisdiction (offshore). Due to various quality and meat yield factors, inshore clams are worth less than offshore clams.

-Fishing offshore and tagging with inshore (state) tags was felt to be a common practice, especially since many processors reported overall meat yields are down and most processors felt supplies will run out before the end of the year.

-Proposed requirements for vessels to report before departure were universally rejected by the processors. In addition to the safety concerns, the impact of 24-48 hour notice before departure would seriously impact the processors ability to manage their raw material supplies.

-There were no objections by processors to call in requirements prior to vessels landing clams, including reporting harvest locations as part of the reporting requirements.

NON-UNIFORM CAGE SIZES:
Under Amendment #8, one tag corresponds to a "standard" 32 bushel wire cage. It was mentioned that in practice cage sizes have reportedly been increased deliberately to increase yield. [redacted]

TAG REQUIREMENTS:

Most processors have a daily login sheet by the unloading area of the plant which is filled out as/after the cages are unloaded. At the end of the day/week, the data is compiled and entered onto the federal logbooks. Several processors have the tag numbers entered onto PC's, often as part of an inventory or meat yield analysis process.

-The mechanics of the federal tagging requirements (the processor logbook) were not viewed as a major problem for most processors. Issuing and keeping tag numbers in a numerical series is identified as an ongoing effort in discussions with vessels. Tags in numeric series help speed up the data entry process if using a PC or when filling out the processor logbooks.

-Most processors did not feel tag breakage was a major problem for them. Processors felt they averaged about 2-5% breakage (2-5 tags per 100 cages received) on incoming cages. Most reported the missing tags could be located if necessary (on the dock, on the bed of the truck, in the plant) but most didn't go to great lengths to locate so few tags.

-Some suggestions were voiced to improve/eliminate the tags, including;
>> Replace the current tags with stronger tags made of nylon or metal which are harder to break

>> use re-enforced fiber paper tags such as those used by the airlines on luggage with peel off allocation numbers to stick on the vessel log and processor log to ease record keeping requirements. If the fiber paper tags can be written on, other information could also be included.

>> a hand held credit card/scanner system which would store a given number of allocations and electronically reduce the allocation as cages are landed or sold or transferred to another allocation holder.

>> use an Honor System similar to that used in January 1992 when no tags were available to allocation holders.

>> The idea of serial numbers on cages was mentioned but rejected since most processors rely on several vessels for supplies, cages are often not returned to the same vessel. It would be difficult to ensure a cage would be returned to the correct allocation holder.

-TAG STORAGE IS A PROBLEM. Almost all processors are unclear as to how long they should keep their used tags. Often the tags are taped together as they come off the truck or vessel, or they are taped together at the end of each day and then boxed. With some processors going through 400-500 cages a day there can be a large volume of tags in storage. Record keeping and inventory controls over the used tags was routinely poor, and it would be difficult to normally locate a given tag within a reasonable time frame.

-Processors have been told conflicting information related to holding tags. Information has varied between enforcement agents, NMFS statistics agents, and different NMFS regional office personnel.

PROCESSOR LOGBOOKS:

-Processor logbooks are not a significant problem for most medium and large processors with adequate clerical staff. Small processors with minimal staff or generally poor record keeping

procedures voiced complaints over the time and effort it took to complete the logs. Small processors often receive supplies from several sources which also increases reporting requirements since many different vessels may be involved and tags were often not in numerical series.

-Medium and large firms generally felt one more person was hired to maintain the logbook reporting requirements (part to full time depending on the volume of clams processed).

[redacted] In many cases it is the clerical help that completes and signs the logs often with minimal verification of the details by upper management.

ALLOCATIONS:

The vast majority of the processors had problems with the way the resource was initially allocated, whether they actually received any allocation or not.

-A routine comment stated that "the vessels with the most violations received the most allocations". There was a general feeling that landings were inflated for the logbooks, vessels violated the fishing time provisions of the FMP, and inactive vessels were reported as fishing to maintain the vessel permit.

-Several processors felt that the Mid-Atlantic Fisheries Management Council acted too quickly and did not listen to the Industry Advisory group recommendations before Amendment #8. Most agreed the plan development process had been going on far too long, and felt that initially the industry was not working effectively within the FMP process. By the time Amendment #8 was passed, many felt the industry was working more effectively together as a group, but recommendations were ignored. Interest is keen and there is strong support for the creation of a new Industry Advisory Panel.

-Several processors felt the addition of Ocean Quahogs in the Surf Clam ITQ allocations process was a mistake based on poor statistical data. There were complaints that processors were not kept adequately informed as the FMP developed and changes, like the addition of quahogs, were not fully discussed.

-Processors questioned existing procedures if allocations were to be held by government agencies under various circumstances.
Two examples mentioned were:
>If a vessel were to be found in violation of the MFCMA and the allocation was reduced or forfeited by NMFS, how would the

allocation be redistributed?
>If the allocation holder lost his allocation to a government agency (as ill-gotten gains) for drug violations, how would the allocation be redistributed?

-Processor concerns about potential shortages of supply as allocations are consolidated into fewer owners. This is discussed under Monopoly Concerns above.

-Processor concerns about allocations owners who do not actively fish or allow their allocations to be fished. This is discussed under Allocation - Use it or Lose it above.

ENFORCEMENT OF AMENDMENT #8:

Most processors noted a drop in the frequency of plant site visits by NMFS Law Enforcement officers since Amendment #8 has been in effect. Prior to Amendment #8, processors indicated weekly visits were routine, while most processors indicated that visits occur once every 2-3 months now.

-Enforcement agents have checked all aspects of the plan pertaining to processor compliance with Amendment #8 including;
>> stopping company owned trucks in-transit to verify all accessible cages are tagged,
>> watching trucks unload at the plant receiving dock with tagged cages,
>> verifying tag numbers are properly assigned to the owner of record,
>> verifying that a specific days plant receipts are in order and agree with vessel records for the same day, and
>> checking storage procedures for the used tags.

-There was a consensus opinion that smaller processors were more concerned with enforcement issues, while the larger processors felt they have more adequate internal controls in place, less financial incentive to violate current regulations and more to lose if violations are identified.

REGULATIONS:

CLAM MINIMUM SIZE ISSUE:
-Most processors felt the minimum size requirement is not needed mainly because market forces require larger clams anyway. Vessels are frequently paid on meat yield and smaller clams provide less of the valuable foot meat, are more time consuming to shuck and process, and can have negative quality characteristics. With the fishing effort restrictions removed, vessels can afford the time to locate beds of larger clams and thereby increase yields and ex-

vessel revenues.

VESSEL CALL-IN PROPOSALS:
-Proposed requirements for vessels to report before departure were universally rejected by the processors. In addition to the safety concerns, the impact of 24-48 hour notice before departure would seriously impact the processors ability to manage their raw material supplies.

BETTER PROCESSOR INVENTORY CONTROLS:
-Processors felt Amendment #8 allows them to better control inventory to match market demand. Prior to Amendment #8, processors had to pack when vessels had their fishing day and hold finished inventory in the plant. Now processors can plan out supplies and work with allocation holders to schedule fishing effort when needed. This reduces the amount of capital that has to be tied up in finished product inventory, and allows for other cost savings by scheduling for such things as down time for employee vacations, equipment maintenance, plant improvements, etc. without worrying about a vessel which has to fish 6 hours within a three week period.

EXPERIMENTAL MAHOGANY CLAM ISSUE:
Most Mid-Atlantic processors felt the clam had little impact on them and the end product was targeted for a different end-users market. There was little outward concern over the issue, unless the inclusion of the Gulf of Maine resource impacted existing allocation holders.

FOREIGN OWNERSHIP CONCERNS:

Several processors voiced concern over foreign ownership of the allocations. With the transferability of the allocation, a wealthy foreign party could acquire a controlling interest of the industry. Since segments of the industry are currently experiencing financial difficulties, if a large conglomerate or wealthy investor groups' long range goals outweighed short term losses, large blocks of allocations could be acquired. Since dealer/processor permits are issued annually, disclosure of ownership requirements may be useful as part of the application renewal process.

-Processors felt more concern over possible foreign ownership than over a possible monopoly by a U.S. corporation. Nationalism was an issue with a feeling that this is a U.S. resource and only U.S. citizens should own it.

RAW MATERIAL PRICES SINCE AMENDMENT #8:

SURF CLAM PRICES:
-Surf clam prices have remained fairly stable since Amendment #8 was approved. There are various payment mechanisms involved in

establishing market price for surf clams. Meat yield is a key factor with expected yields for offshore (EEZ) clams averaging 12-14 pounds/bushel while inshore clams average 9-10 pounds/bushel. Tied in with yield is the fishing location where the clams were harvested, and whether the beds are densely packed which in effect reduces individual clam size and lowers yields.

-Several processors commented that yields are down this year and they felt the allocation would be fully harvested by the end of the year.

-Tied in with reduced yields, most processors expected clam prices to rise by year-end as allocations were exhausted and processors used up remaining carryover inventories.

EX-VESSEL SURF CLAM PRICES:
-Ex-vessel market prices for surf clams vary by processor but currently (2/92) range from $8.00-8.50 per bushel for offshore clams and $6.50-7.00 per bushel for inshore clams. Some processors have contracts with allocation holders which includes a per bushel year-end bonus if all clams are sold exclusively to the one processor for the entire year. These price incentives can be up to $0.25 per bushel.

SALE OF SURF CLAM ALLOCATIONS:
-Surf clam allocations have reportedly gone from initial values of $13.00 - 15.00 per bushel in late 1990, to $18.00 in 1991 and are now reportedly selling at $20.00 per bushel. Processors expect to see the sale of several blocks of allocations in 1992 as the industry continues to consolidate and cash-flow problems force sales of allocations by over-capitalized allocation holders.

LEASE OF SURF CLAM ALLOCATIONS:
Surf clam allocations are currently being leased to vessel owners for $3.00-4.25 per bushel, with most leases running $4.00 per bushel.

-There has reportedly been manipulation of the leasing of clam allocations to reduce the ex-vessel price paid to the boat (known as the boat share) by the vessel owner or use "creative accounting" techniques to improve corporate profits for tax purposes. i.e. the owner receives $8.00 per bushel from the processor, but only pays the vessel on $4.00 per bushel because the owner is deducting the cost of leasing the allocation from the processor. The vessel owner may actually own the allocation but claim it as a lease to the boat or more likely, he may transfer a like share to the processor to create a paper lease trail for tax purposes. Depending on use of general accounting practices for income tax determination, the money used to "lease" an allocation may be taxed differently from the vessel "owned" allocation. (see vessel section of this committees report for more details on the leasing

issue)

OCEAN QUAHOG PRICES:
In contrast with the surf clam, ocean quahog prices have risen significantly since Amendment #8 was approved. As with surf clams, there are several factors which establish the market price. Meat yield is a significant factor in determining the price and yields are dropping. The industry reportedly averaged a standard 8-10 pounds per bushel, but as productive beds are overworked, yields are running 7-8 pounds per bushel now. Location of harvest is an important factor in pricing quahogs. The quality of the meat, amount of sand, size of quahog, amount of trash, etc. vary depending on where the vessels are fishing. Quahogs have continued to gain market share both as an acceptable substitute for some surf clam products, and for use in a wide range of new quahog end products. Health concerns about raw shellfish have also reportedly improved the market for cooked clam products.

EX-VESSEL OCEAN QUAHOG PRICES:
Ocean quahog prices have risen significantly since Amendment #8 was approved. In late 1989 average quahog prices were $3.00 - 3.15 per bushel. After Amendment #8, prices rose quickly to average $3.35 to $3.50 per bushel, and even with processor resistance, prices continued to strengthen and increased again in 1991 to an average of $3.75 per bushel. With declining yields, prices are now running $3.75-4.00 per bushel for quahogs harvested from preferred locations. These are average prices and do not include trucking to the processor. Quahogs caught off Ocean City, MD average $4.00 per bushel, quahogs caught off Atlantic City, NJ average $3.75 per bushel, and quahogs caught off Long Island, NY and Virginia average $3.50 per bushel.

SALE OF OCEAN QUAHOG ALLOCATIONS:
Ocean quahog allocations are reportedly selling for $4.00-6.00 per bushel, with most averaging $5.00 per bushel.

LEASE OF OCEAN QUAHOG ALLOCATIONS:
Ocean quahog allocations are currently being leased for $0.25-0.50 per bushel, with most averaging $0.40-0.50 per bushel. There has reportedly been some manipulation of the lease of quahog allocations - see "Lease of Surf Clam Allocations" discussed above.

IMPACT OF IMPORTS:

Most processors felt that imports would have little impact on domestic supplies in the near term, even if supplies continue to tighten. Processors did not feel there was a good substitute for the surf clam, and none indicated any effort to explore non-U.S. substitutes at this time. Processors did identify potential

foreign substitutes for ocean quahogs (Iceland and Norway were mentioned), but again there had been no reported effort to contact foreign suppliers.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
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;IT 2

Surf Clam/Ocean Quahog ITQ Evaluation

Based on Interviews with Captains, Owners and Crews

By

Kenneth L. Beal

Interviews with NMFS Port Agents and surf clam and ocean quahog fishermen, skippers and vessel owners were conducted in fishing ports in Maryland and New Jersey on February 10-13, 1992. The primary points which we focused on were the acceptablilty of the cage tags currently in use and the perception of whether enforcement has changed as a result of Amendment 8 to the Surf Clam & Ocean Quahog Fishery Management Plan. Most of the people interviewed offered additional comments on other aspects of Amendment 8, although these comments were not solicited. For purposes of reporting all observations, I will first address the key issues, followed by general comments.

CAGE TAGS

Plastic tags, each with a consecutive number, are issued to the holder of the individual transferable quota, and may be kept aboard the vessel, at home or elsewhere in a safe place. Tag numbers are recorded in the vessel logbooks and in the processor logbooks. The theft of tags is not a major concern, as the tag numbers would have to be recorded in the logbooks, and the thief would be easily identified. However, when quotas are transferred, this information is not reported to NMFS, so NMFS Port Agents are not aware when boats are fishing on a purchased or leased quota.

Tags are attached to the 32-bushel cages when the cages are unloaded from the vessel. Previously, tags were attached aboard the vessel, and this practice was both unsafe and resulted in greater tag breakage. Breakage of the plastic tags is generally caused when two cages rub together. Since the cages are fairly rigid steel frames with wire mesh, the tags are sheered off, normally breaking just behind the locking mechanism. When a cage without a tag arrives at the processing plant, the plant notifies the vessel owner and a search for the broken tag begins. Tags are usually found in the truck, on the wharf, and elsewhere in route.

[redacted] It has been suggested that a thin, tough, flexible plastic, as used in Federal Express mailing bags could be used. We have not investigated the cost of these various options.
Failure to use tags does not appear to be a problem with the independent vessel owners, as their catch is normally trucked to the plant, and the likelihood of an enforcement agent being present at the plant is greater than seeing the agent at the wharf. On the other hand, the potential for landing untagged cages is greater if company vessels are landing at company processing plants. It should be noted though, that we are not aware of any such illegal actions, and in fact we were assured by some captains that they would not expect a plant to engage in this practice.

Overall acceptance of the tagging requirement is good. The record-keeping adds another layer to the workload, but the documentation of the catches is quite accurate.

ENFORCEMENT

In all instances, captains, crew and owners reported that law enforcement officers are seen less frequently since Amendment 8 was approved. This is understandable since the primary tool for enforcement now is the cage tag. Furthermore, since the tagged cages are destined for a processing plant, a law enforcement agent could be more efficient by visiting the plants, rather than the wharfs. Agents must still check vessels for the presence of the fishing permit and other regulations, but they do not have to police the fishing hours and days. The primary reason for a recent visit by one enforcement agent was to explain new regulations. We routinely heard comments from the industry that the law enforcement agents were fair and did a good job. One skipper mentioned that he has seen agents at the wharf at midnight and even at 2:00 and 3:00 a.m. We did not hear any criticisms of the agents or how they enforce the regulations.

Certain individuals alleged that New Jersey vessels will fish for a portion of their catch in the EEZ, and also fish inside the state's waters, then claim all the clams came from state waters. This practice would "save" their federal quota until needed. Those complaining of this practice also allege that an informant broadcasts on the ship-to-shore radios when the U.S. Coast Guard helicopter takes off for a fisheries patrol, and boats working in the EEZ then dash into the state waters. However, others stated equally emphatically that this practice is not done. It should

be noted that New Jersey has a quota on the harvest of surf clams within their waters, too. Furthermore, processing plants control whether they want inshore or offshore clams, based on the yield.

OTHER COMMENTS ON AMENDMENT 8

Overall, there is a split in opinion whether Amendment 8 is a success. Some feel that giving a public resource to a select few is wrong. Many boats did not receive a quota equal to their fishing record and tough decisions had to be made whether to continue in the fishery or not. Another complaint involved vessels which intentionally violated the previous regulations, fishing before or after hours, or on wrong days, for instance. Whether or not these violations were detected, the landings were added to the vessel's record, and the ITQ for the vessel was automatically inflated by these illegal landings. In effect, the outlaws were rewarded for their dishonesty.

Some boat owners have had to lease or purchase quotas from others. Purchase prices for surf clam quotas is about $20/bushel, while purchase price for ocean quahogs is about $5/bushel. While this approach is possible if financing is available, small operators without adequate funding have often sold out. Some processing plants have been concentrating quotas, and some family fishing companies have begun an aggressive approach to buy quotas, too. Partnerships have been formed with several vessel owners, mainly to concentrate the amount of quota. Another approach taken by many operators is to concentrate quotas onto fewer vessels, and sell or convert the excess vessels to other fisheries. One operator reduced effort by putting the quotas from 17 boats onto 3, and a family operation with 9 boats has concentrated quotas onto 3 boats. At another dock, only 5 boats are fishing out of 18. Unfortunately, many of the older boats from which the quotas have been taken are unfit to be converted to other fisheries. One owner said he has given a vessel away, and another said one of his was now an artificial reef. Overall, an estimate has been made that about 75 boats are fishing out of 175 permitted in the fishery.

The impact on fishing vessel crews has been significant in many ports. As a result of the concentration of quotas onto fewer vessels, many men were laid off and have been unable to get another berth on a clam vessel. Some were able to fish in other fisheries, and some have shore-side jobs; but still others are unemployed.

The dockside value of surf clams and ocean quahogs has not changed appreciably. Clams are now selling for $8.00/bushel (same price as pre-Amendment 8), and quahogs for $3.85 (up slightly from $3.50). However, the crew shares at settlement have not improved as a result of Amendment 8. Since many of the vessels currently fishing have purchased quotas, the cost of the

extra quota is added to other operating costs, and crew share is reduced accordingly. The normal practice is for operators to assign a value of $4.00/bushel to the leased quota, and this is subtracted from the dockside price of $8.00/bushel. Obviously, crew share is less, and one owner of several vessels estimated a crewman earns about $20,000 less per year now. Some boats have cut crew size from 5 to 3. Most crews are working harder, and earning less.

Under the previous provisions of the FMP, with severely restricted fishing hours and days (6 hours every 3 weeks), boats had to go fishing in bad weather or lose their day. It was hoped that Amendment 8 would eliminate this danger, but unfortunately this has not happened. Processing plants now tell captains when they want a load of clams. Their demands are based on markets, and weather is not a consideration. So boats are often forced to go fishing in bad weather, or lose the connection with that processor. Two vessels which sank in late 1991 (the John Marvin and the Valerie E) were caught in a rapidly-building storm. The crew from the Valerie E were lost, but the crew from the John Marvin were rescued by the Coast Guard. Many people mentioned these sinkings as an indication of no change in the safety factor.

EXHIBIT 3

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
OFFICE OF GENERAL COUNSEL
One Blackburn Drive
Gloucester, Massachusetts 01930
Tel. (508) 281-9211
FTS. 837-9211

CONFIDENTIAL

February 14, 1992

SUBJECT: Individual Transferable Quota (ITQ) Management System

By

Joel G. MacDonald, Regional Counsel

Processing Sector/Shipping: [With the exception of tagging requirements, the transportation of surf clams is only minutely applicable to existing pertinent regulations for this fishery (see 50 CFR, part 652); carriers do not share the same regulatory responsibilities of the vessels and processors.].

EXHIBIT 4

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northeast Region
One Blackburn Drive
Gloucester, MA 01930

February 19, 1992

SUBJECT: SURF CLAM/QUAHOG ITQ REVIEW

By

F/EN3 John J. McCarthy

Approximately 75 vessels are involved in the SCO fishery.

DETAIL REVIEW: SURF CLAM ITQ IMPLEMENTATION PROCESSOR EVALUATION.

MONOPOLY CONCERNS:

The number one concern from processors, large and small, was "control" of a majority of the clam allocation by one major processor.

Processors with allocations can rent/lease their allocation in exchange for exclusive rights to all landings by a given vessel owner To ensure consistent supply, processors without allocations have to use other incentives to encourage exclusive rights to all landings. These incentives add to the cost of the raw material and include; p a y more per bushel at the time of purchase, pay a premium per bushel at the end of the year, offer vessel services (fuel, dockage, gear storage etc.), or offer business loans (vessel mortgage, line of credit, etc.).

Opinions on ways to prevent a monopoly varied, and suggestions included; holding the industry to where it is now, setting a cap of 25-50% maximum ownership by one party, and creating a non-quota Research and Development allocation in deep offshore waters. The consensus was that by the time any controls were implemented, it would be too late to prevent a takeover if one were planned.

Independent processors are concerned about a lack of access to resource as independent vessel owners are bought out by large national or multinational corporations with larger financial

Draft for BC Processor Section
2/92

Processors Issues

① MONOPOLY CONCERNS

Break out or separate issue?

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

② Why include Quahogs w/ Surf Clams

- most felt this was not clearly identified during hearings etc. + were surprised.
- underexploited resource
- little effort ~~to~~ was focused on O Q

check size of cages.

③ Violations / Cheating

- Most likely in locations where ~~dock~~ processor has dock + plant on dock
- via FOIA processors feel not all tags (landings) are being reported
- Inshore vs offshore a big issue esp. since yields are down + most processors feel supplies will run out before end of yr

④ TAGS - mixed reviews majority didn't feel tags were a big problem

- HOW LONG TO HOLD THEM?
- WHAT TO DO WITH THEM
- [redacted]
- Would like to see serial #'s in sequence more. Its easier to record and keep track of.

What other way
- cards w/ scanner
- nylon
- fiber paper w/ bar code peel of tag #'s

(5) Logbooks

- No real problem for processors
- Most have entry sheets to record daily receipts + then at end of week the logbook is filled out
- some just send in computer sheets
- [redacted]

(6) Allocations -

- poorly handled, most felt they were under-allocated while violators were rewarded for illegal activities that increased their share of allocation.
  - "The vessels with the most violations got the largest allocations."
- concern abt allocation being seized for various reasons i.e. violation of FMP or seizure of assets for drug violations - what is the procedure to redistribute allocations if they are seized?
- some processors are having supply shortages as number of independent vels are reduced.

(7) Enforcement

- primarily spot checks infrequently
- Plant visits average once every 2-3 mths.
- F/Ex. 1° look for specific days receipts on file to confirm possible survalence of a vessel where x number of cages were unloaded.
- Trucks have been stopped to confirm all cages were tagged
- Call in before departure is wrong, too difficult with weather, most saw no problem with call in before arrival to port.

(8) Regulations —

> Size – not a problem, most processors pay by yield + if too small, boats get paid less. Also qlty of smaller clams is poor and processors want high quality.

> Call-in before departure is bad idea.

> Issuance of Tags – most would prefer to eliminate tags but couldn't identify acceptable alternative.

> IMPROVED PLANT INVENTORY don't need to hold as much inventory now + reduces capital outlay

(9) Foreign Ownership Concerns
- most feel this is a U.S. resource and we should only allow U.S. firms to own allocations

[redacted]

(10) Want % of Resource to be Outside of Allocation ~~assme~~ process to ~~encourage~~ encourage new R+D technology. I.E. Beyond x depth, allow val allocation to experiment with new gear; new pump technology to allow deeper depths for harvest of under exploited Quahog resource

Resource Estimates Questioned
- Yields are down this year

(11) PRICES

Surfs - HAVE REMAINED FAIRLY STABLE
OFFSHORE vs INSHORE
YIELD 12-14 lbs/bushel 9-10 lbs/bushel

Quahogs
was 8-10 lbs/bushel
Now 2-4 1/2 lbs/bushel yields down, beds being overworked

PRICES

Surfs				Quahogs		
MKT	BUY	LEASE	MKT	BUY	LEASE
OFF 8.50	SEE MEMO		3.50	SEE MEMO	
IN 7.-					
OFF 8-8.25					
IN 6.50-7.-					
NO INSHORE	BUY ? 26-27	lease 4.25		$8 ?	50¢
$8 + 25¢ NICOTINE	$20.-	$4.-	3.75		40-50¢
8.25			3.50-$4.-	$5.	35-40¢
		3.75-$4	3.50-4.-		25-40¢
8-8.50	$20	$3-4		$4-5	50¢

N.J. inshore days cost ~~pay~~ $ 4.80 / 4oz = 32 bushel
or 15¢ / bushel

BIT 5

CLAM/QUAHOG ITQ ADMINISTRATION
HANNAH GOODALE AND MYLES RAIZIN
FEBRUARY 18, 1992

OWNERSHIP ISSUES

GC/NE has suggested that it may be necessary to monitor ITQ ownership because of anti-trust concerns.

HIBIT 6

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northeast Region
One Blackburn Drive
Gloucester, MA 01930

February 19, 1992

Surf Clam/Ocean Quahog ITQ Program Evaluation

Stanley Wang, Ph.D
Supervisory Economist

It is a common knowledge that fishery management systems generally impose constraints on fishery operations and alter producers' strategies in exploiting the fishery resource. The US Atlantic surf clam and ocean quahog fisheries are the first US fisheries which have been managed under a vessel ITQ management system. Prior to 1990, these fisheries were managed with overall quotas and a vessel moratorium program coupled with a set of area closures and trip regulations and gear restrictions. This was a very complex management system for maintaining a year-long fishery and meeting various social and economic objectives. This complex management system had evolved over time and was in place for a period slightly longer than 10 years. During this period, various arguments and counter-arguments were forwarded with an intent to change or maintain this complex system. Finally, the system was replaced with a vessel ITQ system in 1990.

AS the first US fisheries to be under an ITQ management system, the US Atlantic surf clam and ocean quahog fisheries are unique for studying industry behaviors under different management regimes. Our preliminary analysis of the behaviors has revealed some interesting findings. In the Northeast Regional Office, Dr. Stanley Wang has been charged to evaluate the industry performance under different management systems. While his study has been under way, it is to emphasize the evaluation of the industry (harvesting and processing sectorial) behaviors and strategies under the complex management system prior to 1990 and the ITQ system after 1990. Several criteria will be adopted in his analyses and include industry concentration, market share control, pricing, price spreads, fishing patterns, fishery productivity, capitalization, labor employment (fishing crew and related industries), and optimal combination of input (capital and labor). Economic theory of firms and industrial organization as well as statistic theory will be vigorously applied. Relevant statistical tests will be also conducted in the study. Some concerns, arguments and counter-arguments during the development of the ITQ system will be selected for detailed examination and evaluation.

Finally, in views of the current enthusiasm toward limited entry programs including ITQ management systems, this general review chaired by Mr. Edward MacLeod coupled with the Wang study could shed light on design and implementation of any ITQ management systems.

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September 14, 1992

BY FAX AND U.S. MAIL

General Counsel
U.S. Department of Commerce
Room 5883
14th and Constitution Avenue, N.W.
Washington, DC 20230

RE: Freedom of Information Appeal
East Coast Fisheries Foundation, Inc. v. National Marine Fisheries Service, "NMFS"
FOI Request dated 7/16/92; copy attached
FOI Request dated 8/17/92; copy attached
Atlantic Surf Clam Fishery

Dear Sir:

On behalf of East Coast Fisheries Foundation, Inc. ("East Coast") we herewith appeal NMFS's partial denial of a FOI request, copies of the request and denial attached hereto.

NMFS' denial, alleging a section 552(b)(5) exemption, is misplaced. The documents at issue, per NMFS's own description, are "...communications...part of a deliberative process to evaluate [NMFS's] administration of [previously enacted regulations] for the Atlantic Surf Clam and Ocean Quahog Fishery." In other words, the documentation involves agency factual investigation/reporting to determine how well (or poor) the regulations <u>previously</u> adopted serve the industry, the public interest and conservation of the resources.

NMFS's labeling as "predecisional communications" those documents at issue is pure evasion. "Postdecisional memoranda setting forth the reasons for an agency decision already made.. are <u>not</u> exempt from disclosure under 552(b)(5)," <u>Renegotiation Board v. Grumman Aircraft Engineering Corporation</u>. 421 U.S. 168, 183 (1975). Furthermore, "...the public is vitally concerned with the reasons which did supply the basis for an agency policy actually adopted. These reasons, if expressed, within the agency, constitute the 'working law' of the agency and have been held...to be outside of the protection of Exemption 5.", <u>N.L.R.B. v. Sears, Roebuck and Co</u>., 421 U.S. 132, 152-3 (1975).

NMFS's attempt to hide behind an Exemption 5 privilege appears to be a smoke screen to withhold information on the agency's performance, and the effectiveness of its regulations. The documentation requested is exactly what FOI was intended to serve: the bringing/to light of internal agency documents for the public good.

"This basic policy of 'full agency disclosure unless information is exempted under clearly delineated statutory language...indeed focuses on the citizens' right to be informed about what their government is up to'. Official information that sheds light on an agency's performance of its statutory duties falls squarely within that statutory purpose.", U.S. Department of Justice v. Reporters Committee For Freedom of the Press, 489 U.S. 749, 773 (1989).

As the U.S. Supreme Court recently stated in John Doe Agency v. John Doe Corp., 493 U.S. 146 (1990),

> This court repeatedly has stressed the fundamental principle of public access to Government documents that animated the FOIA. "Without question, the Act is broadly conceived. It seeks to permit access to official information long shielded unnecessarily from public view and attempts to create a judicially enforceable public right to secure such information from possibly unwilling official hands." EPA v. Mink, 410 U.S. 73, 80 (1973). The Act's "basic purpose reflected 'a general philosophy of full agency disclosure unless information is exempted under clearly delineated statutory language'. Department of Air Force v. Rose, 425 U.S. 352, 360-361 (1976), quoting S. Rep. No. 813, 89th Cong., 1st Sess., 3 (1965). "The basic purpose of FOIA is t ensure an informed citizenry, vital to the functioning of a democratic society, needed to check against corruption and to hold the governors accountable to the governed." NLRB v. Robbins Tire & Rubber Co., 437 U.S. 214, 242 (1978). See also Department of Justice v. Reporters Committee for Freedom of Press, 489 U.S. 749, 772-773 (1989). There are, to be sure, specific exemptions from disclosure set forth in the Act. "But these limited exemptions do not obscure the basic policy that disclosure, not secrecy, is the dominant objective of the Act." Rose, 425 U.S. at 361. Accordingly, these exemptions "must be narrowly construed." Ibid. Furthermore, "the burden is on the agency to sustain its action." 5 U.S.C. §552(a)(4)(B).

John Doe Agency, id. at 151-2.

A claim of a section 552(b)(5) exemption "...clearly contemplates that the public is entitled to all such memoranda or letters that a private party could discover in litigation with the agency."

Environmental Protection Agency v. Mink, 410 U.S. 73, 93 (1973); FTC v. Grolier Inc., 462 U.S. 19, 26 (1983).

NMFS's tactic that its factual evaluation somehow then attaches a "predecisional" label is incorrect. It wrongfully suggests that NMFS' factual analysis is a predetermination of agency policy, when in fact it is agency re-evaluation of its own policies. "A strong theme of our opinions has been that an agency will not be permitted to develop a body of 'secret law', used by it in the discharge of its regulatory duties and it dealings with the public, but hidden behind a veil of privilege because it is not designated as 'formal', 'binding' or 'final'", Coastal States Gas Corp. v. D.O.E., 617 Fwd 854, 867 (DC Cir. 1980).

You will note East Coast's request (annexed) wherein "notes and memoranda" are requested. We are distressed to see in NMFS' response (annexed) that these items are not even addressed, and would conclude an intentional bad-faith attempt to evade response.

Lastly, NMFS's denial of the 2 page report from Joel G. MacDonald [Esquire] alleging an attorney/client privilege is incorrect. As held in Hickman v. Taylor, 329 U.S. 495 (1947), that privilege only attaches to materials that were (1) prepared in anticipation of litigation, (2) by or at the request of an attorney, and (3) reveal the theory or strategy of the case. See, Coastal States, supra. Furthermore, "...that when an attorney conveys to his client facts acquired from other persons or sources, those facts are not privileged. To allow the contrary rule would permit agencies to insulate facts from FOIA disclosure by simply routing them through lawyers in the agency and invoking the attorney-client privilege." Brinton v. Department of State, 636 F.2d 600, 604 (DC Cir. 1980).

Under all the circumstances and law above mentioned, NMFS's denial of East Coast's FOI request is improper, unwarranted and appears to involve some degree of bad faith. Please be advised that we are fully prepared to litigate this matter.

Your kind response will be appreciated.

Very truly yours,

Ronald R. Coles

Enclosure.
cc: East Coast Fisheries Foundation, Inc.
RRC:tlw

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November 18, 1992

Andrea E. Karsch Druckman, Esq.
Office of General Counsel
U.S. Department of Commerce
Washington, D.C. 20230

RE: East Coast Fisheries Foundation v. NMFS
FOI Appeal

Dear Ms. Druckman:

I note that the Department's final determination (response) is five weeks overdue. May I have your attention.

Very truly yours,

Ronald R. Coles

Enclosure.
cc: East Coast Fisheries Foundation
RRC:tlp

UNITED STATES DEPARTMENT OF COMMERCE
Office of the General Counsel
Washington, D.C. 20230

FEB 12 1993

3-17-93

Ronald R. Coles
Post Road Center
62 Portland Road
P.O. Box 1028
Kennebunk, Maine 04043

Dear Mr. Coles:

This letter responds to your Freedom of Information Act (5 U.S.C. §552) (FOIA) appeal filed on behalf of East Coast Fisheries Foundation, Inc. On the basis of FOIA exemption (b)(5), the National Marine Fisheries Service (NMFS) partially denied the initial request of the East Coast Fisheries Foundation for copies of all documents pertaining to the ownership or property right interest in the Atlantic Surf Clam industry during 1987-1992, including all documents resulting from a survey conducted by Edward MacLeod in the beginning of 1992.

In response to the request, NMFS disclosed the names of all allocation holders and the amount of allocation held by each, and provided releasable portions of the memorandum entitled "Review of the Effectiveness of Our Administrative and Enforcement Obligations Under the Surf Clam/Quahog ITQ Plan" and the attachments (Exhibits 1-6) to that report. The letter from NMFS explained that the responsive documents contain protected pre-decisional communications that were part of a deliberative process to evaluate the agency's administration of the Individual Transferable Quota (ITQ) system implemented as Amendment 8 to the Fishery Management Plan for the Atlantic Surf Clam and Ocean Quahog Fishery.

As explained below, we uphold the decision to deny sections of the responsive records on the basis of exemption (b)(5), with limited exceptions. Our response also covers draft notes prepared in connection with Exhibit 1 which had not been identified at the time of the initial request. These notes are being released in part. We have no information that there were other drafts or notes prepared in connection with the responsive documents that existed at the time the FOIA request was received.

Exemption (b)(5) protects "inter-agency or intra-agency memorandums or letters which would not be available by law to a party other than an agency in litigation with the agency." Exemption (b)(5) incorporates the deliberative process privilege. The policy bases for the deliberative process privilege are to protect candid consideration of alternatives, to protect the

public from confusion that would result from premature release of information prior to a final decision, and to protect the integrity of the decision-making process itself.

The first prerequisite for the deliberative process privilege is that the communications must be pre-decisional, occurring prior to the adoption of particular agency policy. See Jordan v. United States Department of Justice, 591 F.2d 753, 774 (D.C. Cir. 1978). The determination of whether a document is pre-decisional focuses on the role which the document plays during the decision-making process. To help to distinguish between pre-decisional and post-decisional materials, we consider whether the office or person issuing the document has legal decision-making authority. See Renegotiation Board v. Grumann Aircraft Engineering Corp., 421 U.S. 168, 184-85 (1975).

The second fundamental requirement for invoking the deliberative process privilege is that the communication must be deliberative, making suggestions or expressing opinions concerning legal or policy matters. Vaughn v. Rosen, 523 F.2d 1136, 1143-44 (D.C. Cir. 1975). Exemption (b)(5) covers recommendations, draft documents, proposals, suggestions, and other subjective documents which reflect the writer's personal opinions rather than agency policy. See Coastal States Gas Corp. v. Department of Energy, 617 F.2d 854, 866-69 (D.C. Cir. 1980) (Coastal States).

Exemption (b)(5) generally does not protect purely factual material. Environmental Protection Agency v. Mink, 410 U.S. 73, 87-89 (1973). However, facts which are "inextricably intertwined with policy-making processes" may be protected. Soucie v. David, 448 F.2d 1067, 1077-78 (D.C. Cir. 1971).

In this case, the withheld sections of the memorandum from the chairman of the Surf Clam/Quahog Review Committee, the attachments to the memorandum, and the draft notes from one report satisfy the requirements for exemption (b)(5) protection. The withheld materials make recommendations and express opinions with regard to whether or how the regional director should advise the Mid-Atlantic Fishery Management Council (MAFMC) to modify Amendment 8. The regional director has discretion to follow the recommendation of the review committee on what advice to provide to the MAFMC. In addition, we are satisfied that disclosure would cause the decision-makers to be less candid and more cautious in their analysis.

Most of the facts in the materials under consideration were released. Any facts withheld are closely tied to recommendations and generally to the policy-making process. Particularly with regard to the fourth exhibit, disclosure would reveal the analysis undertaken and the particular facts considered, thus causing harm to the agency's deliberations.

In your appeal letter, you argued that the withheld materials constitute "working law" of the agency under National Labor Relations Board v. Sears, Roebuck & Co., 421 U.S. 132 (1975) (NLRB v. Sears). However, the documents under consideration do not constitute "working law" of NMFS. The documents do not explain established policy or otherwise embody the agency's effective law. The reports set forth opinions and suggestions on whether and how the ITQ system should be modified. The regional director or the MAFMC need not follow any of the recommendations presented. See Coastal States, 617 F.2d at 868-69; NLRB v. Sears, 421 U.S. at 153.

NMFS made a discretionary release of portions of the responsive documents, including most of the draft notes, that could have been protected under exemption (b)(5). NMFS chose to be as open as possible and withhold only those statements where release might have a chilling effect on the administrative decision-making process.

We are releasing on appeal portions of three additional items, including portions of one page which was inadvertently omitted in the response and of draft notes mentioned above.

Your appeal also challenged NMFS' reliance upon the attorney-client privilege to withhold one document. You claim that the attorney-client privilege only applies to materials prepared in anticipation of litigation, by or at the request of an attorney, and which would reveal the theory or strategy of the case. This is incorrect.[1]

The attorney-client privilege protects confidential communications between an attorney and his client relating to a legal matter for which the client has sought professional advice. Mead Data Central, Inc. v. United States Department of the Air Force, 566 F.2d 242, 252 (D.C. Cir. 1977). An agency may be a "client" and an agency lawyer may be an "attorney" for purposes of the privilege. See Coastal States, 617 F.2d at 863.

The document at issue, Exhibit 3, is properly protected by the exemption (b)(5) attorney-client privilege. In the report, Joel G. MacDonald, Regional Counsel, presented his views on various legal issues in responding to a request from Mr. MacLeod of NMFS, his client, whether there are any legal deficiencies in the ITQ system that might be remedied through a change to existing procedures.

This is the final decision of the Department of Commerce. You

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[1]The attorney work-product privilege, not the attorney-client privilege, protects documents prepared by an attorney in contemplation of litigation.

have the right to obtain judicial review of the denial as provided in 5 U.S.C. §552 (a)(4)(B).

Sincerely,

Barbara S. Fredericks

Barbara S. Fredericks
Assistant General Counsel
for Administration

Enclosures

the village VOICE

NATIONBEAT

VOICE May 25, 1993

LITTLE FISH, BIG POND

ON THE EVE OF the first day of whiting season last month in the Pacific Northwest, the Department of Commerce reversed its regional fishing council and handed over the lion's share of the upcoming harvest to huge fishing trawler factories controlled by the Tyson Corporation. The CEO, **Don Tyson**, has been a generous contributor to **Bill Clinton** since his days in Little Rock.

The Commerce override of the local panel has pitted large corporate interests against small family fishing operations that have worked the fishery for decades and it will likely push the small operators to go after other species of fish already depleted.

Tyson executive **Archie Schaffer** says the company had no specific role in the decision, though he concedes Tyson along with other companies was represented by a lobbying group, the American Factory Trawlers Association, that fought hard for the Commerce ruling. "It is absurd to suggest it was a political payoff....Tyson Foods interests in Oregon are more with shoreside interests."

Tyson first got into the factory trawler business last October when it spent $200 million to acquire Arctic Alaska's fleet, including 11 Pacific trawlers.

At least one Democratic member of Congress was less than thrilled by the executive branch's action: "The blatant disregard of the Pacific Council's recommendation by Commerce sends a message that hard work and good faith efforts can be easily and arbitrarily overturned by politics," says Congresswoman **Elizabeth Furse** (D-Oregon).

Secretary of Commerce **Ron Brown**'s spokesperson **Jim Dexter** insists that Commerce's reversal was an allocation of "the conservation burden equitably.... Political considerations were not involved."

But **Larry Six**, executive director of the Pacific Fishery Management Council, maintains the move had little to do with equity. "Apparently the Secretary of Commerce can do whatever he wants. We had to make our decision based on an analysis including biology and economics but he did not follow that protocol. If the game is going to be played back East at high levels, why should fishermen participate in our process, which is democratic and open?"

The Pacific Council had hoped its decision would mean a whiting season lasting from April to November, extending the work weeks of small shore-based fishers and processors. Under Commerce's rule, the season will be quite short. Already in the first week, the factory trawlers sucked up 24,000 of the total 140,000 ton annual harvest permitted. The small boats snagged only 200 tons over the same period. "That's the tally of the open-style competition," laments Six.

This is not the first time the administration has overruled local fishing councils. In March, Commerce tossed out a decision by Alaska's North Pacific Fishery Management Council to reduce this year's harvest of ocean perch.

And the Pacific Northwest decision may be just the first ripple for the small-time family fishing boat operator. According to the North Pacific Fisheries Protection Association, the Clinton adminstration intends to follow through on Bush era plans to privatize the nation's fisheries by granting individual fishing quotas that will benefit huge food conglomerates.

These quotas would give recipients an exclusive allotment of fish in perpetuity, and would be based on the number of fish caught in recent years.

Commerce's **William Fox** testified before Congress in 1991 that the quota system is the best way to help depleted species restore themselves because it restricts the number of boats working the water, even though it will presumably not mean a reduction in the total number of fish allowed to be caught.

Critics of federal fishery management contend that if there are too many vessels in the water, Commerce is partly to blame. Over the past 17 years, the department has underwritten up to $47 million annually in loans for the industry's retooling and new construction. Tyson's Arctic Alaska alone accumulated $53 million of these loans by 1991. Commerce, apparently concerned about overcapitalization of the industry, suspended the program late last year.

Jim O'Malley, executive director of the East Coast Fisheries Foundation, says the first application of the quota system, in the surf clam fishery, has radically changed that industry. "Where there were 700 jobs there are now 200. Where there were as many as 50 companies working there are now just three. Ultimately this is bad news for the consumer because profits can be hugely inflated by restricting competition."

Indeed, for Tyson the move toward privatization was a major motivatnr in the company's entry into the seafood market. According to the trade journal *Seafood Business*, it was part of the "total picture" that convinced Tyson brass they could "corral" enough seafood to turn a profit.

And there's another incentive. Despite the red ink drowning the Federal budget, while the entitlements are to be granted by the government free of charge, they can then be sold by the recipient. —ROBERT HENNELLY

2sided Copy

SB Interview

TYSON FILLS ITS PLATE

■ Seafood Group completes the protein package

By Kris Freeman

So, what do you get when you cross a pollock with a chicken? A whole new set of corporate symbols.

"We used to give out a little gold chicken lapel pin when our staff met sales goals," says John Tyson of Tyson Foods Inc., which recently acquired whitefish and surimi suppliers Arctic Alaska Fisheries Corp. and Louis Kemp Seafoods Co. "Now we're going to have to regroup and come up with something that also has beef and pork and fish on it."

Sales symbolism, accounting systems, product lines — all are in flux as Arctic Alaska and Kemp plumb their massive production capacities into the Tyson marketing pipeline. The hierarchy of brand names, for instance, was still being decided at press time. Arctic Ice, Arctic Alaska's brand, and Tyson are both known at the foodservice level, says Tyson, who notes the one way to come up with a "one-plus-one-equals-three situation" might be to label seafood products with the moniker: "Arctic Ice, another fine food from Tyson Foods." The same goes for Louis Kemp's trade names — Crab Delights, Lobster Delights and Ocean Master — which have built a powerful retail presence.

PHOTOGRAPHS BY DOUG RUNGER

Center of the plate

Center Of The Plate is more than an academic topic at Tyson, a value-added chicken giant fast becoming a one-stop-protein shop. During 1991 the company concentrated on integrating new beef products into its line of foodservice products and retail frozen dinners. (Pork products were already on line.) In 1992, the publicly owned company turned to the gap in its protein mix — seafood.

In August, Tyson Foods agreed to buy out Arctic Alaska shareholders for an estimated $212 million; it committed another estimated $21 million to purchase Louis Kemp from its former owner, Oscar Mayer Foods (itself a Philip Morris/Kraft General Foods subsidiary).

■ The whole setup — with Arctic and Kemp catching and processing and Tyson selling, marketing and distributing — theoretically makes good integrated-marketing sense. "It's a real nice fit."

As a result, Arkansas-based Tyson Foods Inc. now controls a major share of the U.S. surimi market. Arctic Alaska, owner and operator of the nation's largest fleet of

factory trawlers, is one of the biggest suppliers of raw surimi; Kemp has a lock on nearly two-thirds of the U.S. retail sales of prepackaged surimi analogs (a.k.a. imitation crab, lobster, etc.).

With the establishment of its new "Seafood Group," Tyson also has access to blocks and fillets of North Pacific whitefish species, including pollock, cod, yellowfin sole and Atka mackerel as well as tanner and king crab.

In return, Arctic Alaska and Kemp anticipate a quantum leap in marketing power. Tyson Foods sold more than $4.1 billion worth of chicken, beef and pork during the fiscal year that ended October 15, 1992. When the company applies its customary battle plan of "Segment, Concentrate, Dominate" to the seafood business, results are apt to be impressive.

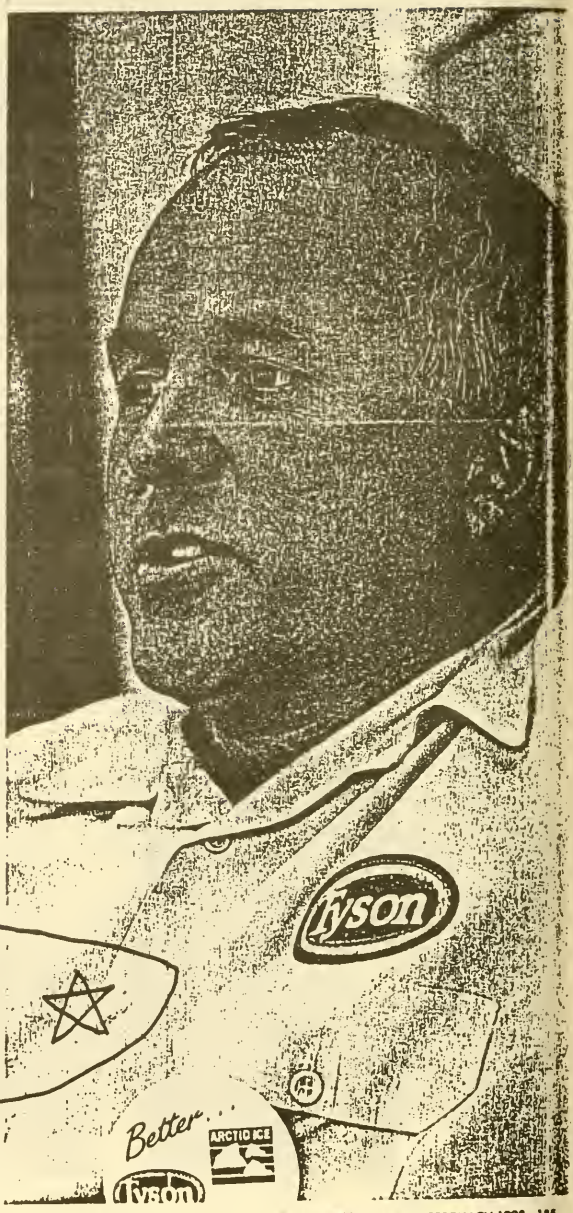
The whole setup — with Arctic and Kemp catching and processing and Tyson selling, marketing and distributing — theoretically makes good integrated-marketing sense. It's a "real nice fit," says Arctic Alaska President and CEO Ron Jensen. "There's a lot of synergy," seconds Roland Chambers, Louis Kemp general manager and vice president in charge of all the shore plant operations in Tyson's Seafood Group.

■ "We've had fifteen to eighteen years in taking the basic component, chicken, apart and putting it back together in products the customer wants."

But why now? Why buy a seafood company at precisely the time when numerous seafood brokers wish they sold used cars?

The Tysons took their cue from recent shifts in North Pacific fisheries management, specifically the trends toward individual quotas, or ITQs, says John Tyson, the executive in charge of integrating the Seafood Group into the Tyson Foods fold. The Tysons were also impressed by overseas expansion and value-added programs already initiated by Arctic Alaska.

Groundfish quotas in the North Pacific have held steady at about 2 million metric tons annually. "If we [Arctic Alaska] are good and efficient at how we catch it, we're going to get our percentage. Maybe if



4 NATIONAL FISHERMAN JUNE 1993

Can Clinton change things?

To the Editor:

In regard to the letter entitled "No unity for commercial fishing?" written by Bob Jones of the Southeastern Fisheries Association and published in the January '93 NF, I would like to add a word of warning.

Bob expressed outrage at the actions of Joe Blum, Dennis Phelan and Ted Kronmiller (who reportedly represent large West Coast companies) during the recent meeting of the fishing industry with (former) Secretary of Commerce Barbara Franklin. He also expressed optimism that the arrival of the Clinton Administration might offer an opportunity to reverse some of the bad policies that have been put in place regarding fishery management over the past several years.

I hate to say it, but it appears to me that any optimism concerning the new administration's willingness to carefully and impartially examine fisheries management policies and to modify them with a view toward making them more fair and equitable is premature.

On Jan. 29, literally within hours following his appointment as secretary of commerce, Ron Brown approved the North Pacific Fishery Management Council's IFQ plan for the Alaska sablefish [blackcod] and halibut fisheries. The IFQ plan (a half-baked and poorly justified giveaway of public resources to special interests) met overwhelming opposition from Alaska fishermen during public testimony, was opposed by every Alaska coastal community and was unanimously opposed by the Alaska House of Representatives.

In the *Anchorage Daily News* article of Jan. 30, which reported Brown's approval of the plan, it was pointed out that "Kronmiller was a fisheries official at the State Department under President Reagan. More recently, he was a law partner of Ron Brown, the new Commerce Secretary."

I suggest to all readers of your fine publication that deals made behind closed doors remain vastly more important in the formulation of policy than open forums in which the American people are invited to participate.

Good Luck Bob. Keep your guard up!

Pete Farris
Anchorage, Alaska

A4 Seattle Post-Intelligencer, Saturday, January 30, 1993

PAUL JOSEPH BROWN/P-I

Halibut fisherman John McHenry in front of his 80-year-old boat. Established boats will benefit from the quota, he says; others won't.

Radical quotas in place for cod, halibut fishing

By Scott Sunde
P-I Reporter

The Commerce Department took the first step yesterday toward a radical change in the way billion-dollar fisheries are managed off Alaska and the West Coast.

It gave final approval to establish individual quotas in the halibut and black cod fisheries.

Supporters, including many Seattle fishermen, say the change means better quality and more fresh fish for consumers and longer, safer fishing seasons.

Opponents say the system will create a privileged class of fishermen and will devastate coastal communities that rely on fishing.

The black cod and halibut fisheries in Alaska are worth about $150 million annually. The new system will give Washington state fishermen an estimated 21 percent of the halibut and almost half the black cod.

The quotas will be handed out to vessel owners and lease holders based on how much fish they caught in past years. The quotas can be bought and sold, but single fishermen will be limited in how much of the market they can control. Fishermen cannot buy and sell quotas between categories of vessels — an effort to stop the owners of larger, Seattle-based boats from buying the quotas of smaller, Alaskan boats.

The change to individual quotas is revolutionary, said James Crutchfield, a professor emeritus at the University of Washington and an expert on the economics of the fishing industry.

Traditionally, the government has allowed fishing

See FISHING, Page A4

Fishing: Rule grants property rights to a natural resource

From Page 1

by a so-called "Olympic system." There's no limit on the number of fishermen, and each boat is allowed to haul in as many fish as possible while the season lasts.

But under the individual quotas, each fisherman is assigned an amount of fish. In other words, fishermen are granted a property right to a natural resource.

"That means each individual fisherman has an incentive to fish efficiently," Crutchfield said. "You don't get this race to get yours before the other hoarder does. It makes the fishery operate like the rest of our economy."

The individual quotas for halibut and black cod could go into effect as early as 1994. A similar system is being studied for pollock and crab in Alaska and for groundfish along the Washington and Oregon coasts.

Some fishermen will be forced out. Some won't qualify for a quota because they haven't been fishing long enough. Many crew members may lose their jobs as one boat buys up several quotas.

"People who have participated in the fishery will benefit fairly," said John McHenry, a Seattle fisherman. "And the people who haven't are not going to come out of it so good."

At worst, the individual quota system could mean a loss of nearly 15,000 fishing jobs, said U.S. Rep. Don Young, R-Alaska.

"We have communities strung out from southeast Alaska to the Bering Sea where the only source of income is fishing," said Matthew Donohoe, a Sitka fisherman.

Problems with the old fishery management system included:

■ **Short seasons.** The black cod season that once lasted for months now lasts no more than a week or two because so many fishermen are involved.

The halibut fishery has been reduced to a few 24-hour "derbies" each year.

In 1992, fishermen caught more than half the year's halibut quota in one 24-hour opening, said Bob Alverson of the Fishing Vessel Owners' Association in Seattle.

■ **Waste.** Typically, halibut fishermen put out far more gear than they need. When the 24-hour opening ends, they cut their lines still heavy with fish. The fish die on the bottom.

As in a pie-eating contest, Alverson said, "When you're through eating the pie, you have a lot on yourself and on the picnic table."

■ **Quality.** Much of the fish ends up frozen because it arrives so suddenly and in such large amounts at processors.

■ **Safety.** With a few days or weeks a year in which to make a living, fishermen take their boats out no matter the weather. Seven halibut fishermen died in 1992 in Alaskan waters.

NEWS-IN-BRIEF

ITQs for surf clam, and ocean quahog fishermen?

GALILEE, RI - A major change in surf clam and ocean quahog management is up for public comment at a round of hearings held by the Mid-Atlantic Fishery Management Council in February and March.

The council will hold a public hearing here March 8 to receive comments on Amendment 8 to the Fishery Management Plan (FMP) for Atlantic Surf Clams and Ocean Quahogs. The Galilee hearing will be held at 7 pm, March 8 at the Dutch Inn on Great Island Road.

A March 6 hearing will be held at 7 pm in the Cape May County Extension Office, Dennisville Rd., Cape May, NJ. Hearings were also held in late February in Pocomoke, MD and Pomona, NJ.

In an effort to alleviate fishing effort problems and inefficiencies in the surf clam and ocean quahog fishery, the council initiated consideration of a management scheme that would give individual transferable quotas to surf clam and ocean quahog fishermen. This proposal became known as Amendment 8.

The amendment proposes a number of things including the creation of an allocation permit for harvesters, a permit for buyers, and a fee schedule for the permits, as well as initiating a vessel allocation system.

It would also reduce the surf clam minimum size to 4.75", initiate a requirement that all surf clam and ocean quahog cages must be tagged from the time the product is placed into the cage; prohibit shucking surf clams or ocean quahogs at sea; and remove the moratorium on the entry of new vessels into the mid-Atlantic surf clam fishery.

Additionally, Amendment 8 would allow the regional director to require that vessel owners or operators notify the National Marine Fisheries Service before a vessel departs the dock on a trip and before the vessel reaches the dock from a trip on which surf clams or ocean quahogs were caught.

For more information, contact John Bryson at (302) 674-2331. ■

Surf clam plan draws fire

DOVER, DE - Overwhelming opposition. That was the response the Mid-Atlantic Fishery Management Council got when it took its proposed vessel allocation system for surf clams and ocean quahogs out to public hearing early in March.

The public objection was not directed solely to the allocation concept, explained Dave Keifer, council deputy director.

"We got a lot of comments, some supportive and some suggesting changes, a lot of changes," Keifer said. "Some people liked the idea of allocations, but not the proposed allocation system. There was opposition to removing limited entry on (ocean) quahogs. The prohibition on shucking (sea clams) at sea received opposition."

It's unlikely that the opposition to this draft of Amendment 8 was stronger any-

continued on next page

Surf clams

continued from previous page

where than in the single hearing held in New England on March 8 in Galilee, RI.

New Englanders trying to get into the surf clamming business have been hampered by a 1977 moratorium which prevents them from fishing in the rich Mid-Atlantic area.

Under the Mid-Atlantic council's plan to combine the two New England surf clam/ocean quahog management areas - Nantucket Shoals and Georges Bank - with the Mid-Atlantic area, they stand to lose even more.

Because they have not had access to the Mid-Atlantic area, these New England boat owners would likely receive an unacceptably small percentage of the annual quota under a vessel allocation system.

"The consensus view (of the New England council and its industry advisors) is that the specific proposal to create an individual vessel allocation system under any of the identified potential formulas is detrimental to the interests of those currently involved in the New England fishery," Bob Smith, New England council member from Rhode Island, said at the hearing.

Stating the position of the New England council, Smith advocated excluding the New England area from any surf clam/ocean quahog vessel allocation system and continuing to manage the fishery in this region under the individual area quotas set up in Amendment 7.

For the past two years, the Mid-Atlantic council has been working to come up with a new system for surf clam/ocean quahog management.

The council considers the fishery to be overcapitalized; while the resource appears to be relatively healthy, the current quota system restricts vessels working in the mid-Atlantic to only a few six-hour trips every three months.

But Amendment 8 as it now reads is unlikely to provide a quick fix to the fishery's problems.

"It remains a very complex, controversial amendment," observed Jack Terrill, surf clam plan coordinator for the National Marine Fisheries Service Northeast Region in Gloucester.

According to Dave Keifer, the Mid-Atlantic council will not give further consideration to draft Amendment 8 before its June council meeting.

Lorelei Stevens

Surf clam challenge fails COMMERCIAL FISHERIES NEWS • MAY 1991 • 7A

Federal court decision upholds ITQs

WASHINGTON, DC - Doubts about the legality of ITQs were largely dispelled early in April when a Federal District Court judge basically brushed off a challenge to the latest version of the Surf Clam and Ocean Quahog Fishery Management Plan.

The court determined that ITQs "were contemplated by Congress and are doable," explained Jack Terrill, a policy analyst with the National Marine Fisheries Service (NMFS).

The court's decision was specific to the surf clam/ocean quahog ITQ system. But it will likely be interpreted by fishery managers as a go-ahead to consider ITQ-based management, which limits participation in a fishery to those holding an allocation, for other fisheries.

(The case did not specifically consider the plight of more than 70 Maine vessels which did not receive an initial ocean quahog allocation. These vessel are currently working under an experimental fishery permit that expires Sept. 29.)

ITQs are individual transferable quotas. The ITQ system in question here was developed through Amendment 8 to the surf clam/ocean quahog plan and is the first established under the Magnuson Fishery Conservation and Management Act.

On Sept. 30, 1990, NMFS implemented Amendment 8, and parceled out percentages of the annual surf clam or ocean quahog quotas to boat owners with a federally documented history in the fisheries.

The quota share was calculated using a complex formula which included the vessel's historic catch and size. Fishermen with a share of the annual quota can fish, sell, or lease their own share, and buy or lease shares from others.

On July 13, 1990, two groups of fishermen and processing companies filed suit against the Department of Commerce (NMFS parent agency) challenging the ITQ system and claiming it had caused them serious economic harm.

Among several points, they argued that the ITQ system exceeded NMFS' statutory authority and that the implementation of ITQs violated National Standards and other provisions of the Magnuson Act.

Privatization

According to the judge's decision, the plaintiffs argued that an ITQ system amounts to privatization of the resource and that "such a 'uansfer of private ownership interests in a fishery' is both unauthorized by the Magnuson Act and in conflict with an expressed prohibition on the assessment of fees in excess of costs."

But Judge Michael Boudin basically found that Congress, through the act, did authorize the creation of quotas. Further, he noted that permits were transferable with sale of the vessel under previous versions of the surf clam/ocean quahog plan.

"The present ITQ system differs only in degree from the system of aggregate quotas and transferable permits previously in use and unchallenged by plaintiffs, and the interests created by it fall short of actual full-scale ownership," Judge Boudin wrote.

He also noted that "the new quotas do not become permanent possessions of those who hold them.... These interests remain subject to the control of the federal government which, in the exercise of its regulatory authority, can alter and revise such schemes..."

The judge brushed aside the claim that, because fishermen must purchase or lease quota from quota holders in order to get into the fishery or expand existing operation, ITQs violate the prohibition on assessment of fees in excess of costs.

"Certainly payments are a barrier to a fisherman who wants to fish but does not possess an ITQ, but an even greater barrier would be provided by quotas that were not transferable at any price," he wrote. "Neither regime involves (NMFS) raising revenue in excess of costs."

Cheating pays

The plaintiffs attempted to convince the judge that the ITQ system violates the Magnuson Act's National Standard 4, which requires that fishery management plans not discriminate between residents of different states, and says:

"If it becomes necessary to allocate or assign fishing privileges among various US fishermen, such allocation shall be A) fair and equitable to all such fishermen; B) reasonably calculated to promote conservation; and C) carried out in such manner that no particular individual, corporation, or other entity acquires an excessive share of such privileges."

The plaintiffs claimed the ITQ system violated the standard by rewarding violators of prior regulations and by discriminating against owners of smaller fishing fleets.

Similar concerns have surfaced during the New England Fishery Management Council scallop committee's deliberations over possible individual allocations of fishing days or quota as a replacement of the current meat count system.

In commenting on this portion of the case, Judge Boudin endorsed the concept of fishery management councils developing fishery plans and NMFS promulgating regulations based on the best available information, even if that information is clearly lacking. In doing so, the judge also stressed the importance of building "an administrative record" to back up management decisions.

According to the judge's decision, the Commerce Department argued that "since a majority of the participants in the fishery cheated to some degree, it is impossible to determine which vessels were involved in the violation.... The record demonstrates that the council and the secretary considered this problem.

"It is not clear how adjustments could be made to eliminate the effect of previous violations, many of which, it is fair to suppose, were never detected, and others which have already been punished. Plaintiffs have failed to demonstrate that this use of past histories is irrational or that it violates the Magnuson Act."

The judge offered this suggestion for those fishermen who feel disadvantaged by initial allocations: "It is quite possible that scale economies and transferability of ITQs will produce some consolidation. It is also possible that small fishermen enjoy advantages of their own, and nothing prevents coalitions of small owners from pooling their allocation to obtain efficiencies."

Ocean quahogs

The plaintiffs also attempted, without success, to convince the court that NMFS erred in placing the ocean quahog fishery under the same management regime as surf clams. They argued that the administrative record did not support the decision and, since there is no overfishing or overcapitalization problem in the ocean quahog fishery, a limited access system is not justified.

See ITQs, 13A

ITQs

Continued from 7A

However, the judge concluded that the council and NMFS had indeed established a solid enough record to back up the decision to include ocean quahogs in the ITQ scheme.

Citing a standard established in a previous case which precludes the court from substituting its judgment for that of NMFS, Judge Boudin stated:

"The court concludes that the secretary's decision, though based on conflicting, even speculative, evidence about trends affecting the ocean quahog resource in the future, nonetheless had a rational basis, and was not arbitrary or capricious."

He further added: "Both regulators and fishermen have an interest in having ground rules established before any problem matures. Contrary to plaintiffs' arguments, the act does not mandate any finding of necessity before fishery access can be limited."

As of mid-April, there was no indication that the judge's decision would be appealed, according to Terrill.

Lorelei Stevens

COMMERCIAL FISHERIES NEWS • DECEMBER 1992 • 5A

Fishing communities mourn loss of Atlantis, Mae Doris crewmen

NEW BEDFORD, MA - The fishing communities of New Bedford and Cape May, NJ were rocked early in November by the loss of two vessels with all nine fishermen onboard.

Five days of Coast Guard searching yielded no trace of the 72' New Bedford-based dragger Atlantis nor of her five-man crew. An extensive five-day air and sea search turned up only a fender with a line matching the description of the Cape May clammer Mae Doris and her crew of four.

Both vessels were reported missing on Oct. 30. The Coast Guard does not believe that weather was a factor in either case. Both vessels were equipped with 406 EPIRBs. No signals were received by the Coast Guard.

After covering nearly 100,000 square miles, the Coast Guard suspended its search for the Atlantis on Nov. 4, leaving the families and friends of the missing crewmen to their grieving.

Presumed lost were: Francisco M. Barroqueiro, 32, captain of the vessel with five years experience as captain; Antonio de Pinho, 46, first mate and a seasoned fisherman; Joaquim Caseiro, 59, deck hand and a seasoned fisherman; Edgar P. Lobo, 35, engineer, a retired merchant mariner with a few months fishing experience; John B. Barros, 43, also a retired merchant mariner new to fishing.

All five men were longtime residents of the New Bedford area who had come to this country originally from Portugal or Cape Verde. Among them they had 14 children.

Over 700 people crowded into Our Lady of Mount Carmel Church in New Bedford on Nov. 7 for a prayer service for the missing men. Saint Ann's Church in Gloucester also held a special mass on Nov. 15.

The Atlantis was owned by ABC Fishing Corp., whose principals are Antonio Pedrosa, Benjamin Pedrosa, and Carlos Vinagre. Pedrosa said his last contact with the boat was on Oct. 23 when she had pulled into Nantucket for refueling and repairs to a fresh water tank. The vessel was last seen about 45 miles southeast of Nantucket.

By the time the search was suspended, Coast Guard vessels and aircraft had searched over 98,000 square miles from east of Provincetown south to an area east of the Maryland coastline. During the search a light-colored tarp or net was spotted, but searchers were unable to locate it when they returned to retrieve it.

The search was resumed briefly on Nov. 5-6 when a tanker reported spotting an orange life ring floating in the shipping lanes 90 miles south of Martha's Vineyard, but Coast Guard searchers could not locate the ring. The Coast Guard cautioned that there was no evidence that the ring or the tarp had any association with the missing vessel.

Fishermen in New Bedford speculated that the dragger might have gotten hung down and capsized or been run down by a larger vessel. But, as of mid-November, there was absolutely no evidence of what had happened to the Atlantis.

Mae Doris

The 87' Mae Doris was last seen approximately 38 miles southeast of Cape May. The fender which could have come from the vessel was recovered on Oct. 30, the first day of the search. Subsequently, a life ring with the vessel's name hand-written on it and other items were found washed ashore near Tom's Cove on the Virginia/Maryland border on Nov. 4 or 5.

But there was no sign of the vessel's four crewmen: Rick Goodwin, vessel operator, Cape Charles, VA; Bill Kane, no address available; Richard Layton, Ocean City, MD; and, Michael Hutton, North Wildwood, NJ.

Coast Guard-dispatched aircraft and vessels had covered 27,800 square miles when the search was suspended on Nov. 3.

The Mae Doris is at least the third mid-Atlantic clam boat to sink in the last year, and the second to go down with all hands. According to the Coast Guard, the clammers have been making short trips and carrying heavy loads. Instability of the loads is believed to be a factor in the accidents.

The fact that there was no EPIRB (emergency position indicating radio beacon) signal from either vessel is raising concerns among fishermen and Coast Guard officials. A Coast Guard spokesman warned that fishermen who mount their EPIRBs inside the vessel's cabin may not have time to free the device in the case of a catastrophic accident such as a collision or sudden capsizing.

A rusty bracket can also keep the EPIRB from floating free. The satellites can only pick up and transmit EPIRB signals if the unit is floating on the surface.

Finally, the big reminder is to make sure the EPIRB is armed correctly.

The 70' Gloucester-based swordfish vessel Andrea Gail was last heard from during the vicious Halloween week ocean storm last year. The vessel and her six-man crew were lost. The boat's 406 EPIRB was recovered, its switch in the "off" position which prevented it from transmitting an emergency signal.

Lorelei Stevens

COMMERCIAL FISHERIES NEWS • NOVEMBER 1992

ITQs

Solution to the 'tragedy of the commons' or tragedy for the common man?

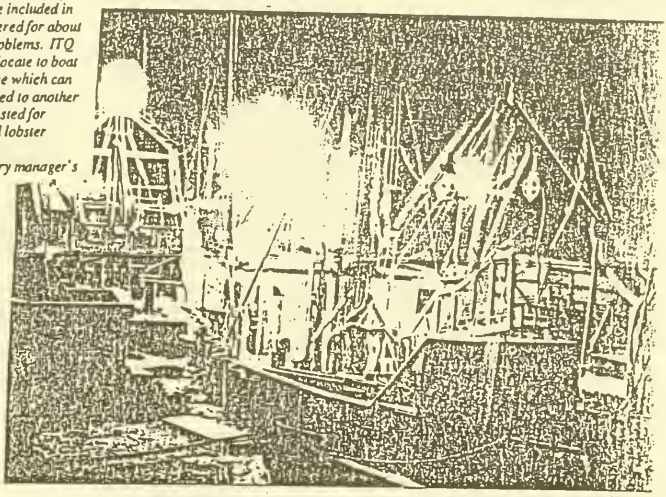
These days, ITQs — individual transferable quotas — are likely to be included in the range of solutions considered for about any fisheries management problems. ITQ systems — which typically allocate to boat owners a share of the resource which can then be fished, or sold or leased to another operation — have been suggested for managing the sea scallop and lobster fisheries.

In theory, ITQs are a fishery manager's dream come true. After issuing initial allocations, the free market takes over, eliminating the need for further regulation. By conferring ownership rights and responsibilities on a select few fishermen, the "tragedy of the commons" is supposed to be derailed.

But reality is rarely as neat as theory.

Two years ago the United States put its first ITQ system in place. The impact it has had on the surf clam and ocean quahog fisheries is staggering; the clam industry has been fundamentally changed forever.

Whether that change has been good or bad depends on who you are. Some vessel owners reportedly became millionaires overnight. Others lost their jobs as commercial fishermen, probably forever. Some processors can now get the clams they want, when they want them, at the price they want to pay. Others have been absorbed by corporate giants.



While surf clam vessels go about the business of landing product, the consequences of ITQ management of the fishery continue to be examined.

MIT Sea Grant Marine Advisor Madeleine Hall-Arber, Ph.D., has pieced together the story of how the ITQ system has altered the clam fishery and affected the people involved. Particularly in light of the National Marine Fisheries Service ongoing mission to achieve "economic efficiency" in US fisheries, her findings give us all food for thought. —Editor

Fishing TRENDS

SECTION B

by Madeleine Hall-Arber

DOVER, DE - With the implementation of Amendment 8 to the Atlantic Surf Clam and Ocean Quahog Fishery Management Plan on Oct. 1, 1990, individual transferable quotas (ITQs) were instituted for the first time in a federal fishery of the United States.

Often viewed by fishery managers and economists as a way to resolve the "tragedy of the commons," some fishermen and small businessmen are now wondering if ITQs might, in fact, constitute a tragedy for the common man.

By all accounts, the ITQ system has succeeded in its objective of "rationalizing the fishery" by reducing the number of boats and people working to harvest the resource.

Consequently, the ITQ system has also resulted in a number of small firms losing their niche in the clam industry and has had major effects on clam boat crewmen.

"Many former clammers have been forced out of the fishery; many others are working longer hours for less money; and many clammers said that they are working in worse weather than they worked under the old system," wrote anthropologists Bonnie McCay and Carolyn Creed in their July 1992 project progress report "Social Impacts of ITQs in the Sea Clam Fisheries" for the New Jersey Sea Grant Program.

Dave Wallace, a Salisbury, MD-based fisheries business consultant, worked for clam giant American Original, a harvesting and processing company, in the '70s and early '80s and was involved when the original management plan was being developed.

ITQs, he says, are instituted as a way to reduce numbers when there are too many participants in a fishery.

"The nature of the beast is that no one is allocated enough to support themselves," he said. "Vessel owners without enough quota to support themselves (and without enough financing to purchase additional allocation) have the option to sell their vessels and lease their allocations, or sell both and retire or look for work in another industry. The wealthy take out the less wealthy, but it is probably better than just going broke."

Common resource

Managers have cited the clam fishery as an example of the "tragedy of the commons," which refers to the idea that when enough people have unlimited access to a renewable resource, they will ruin it through overexploitation.

As one fisherman put it, "I'm going to fish as hard as I can today because if I don't, someone else will."

The tragedy is that there is no guarantee that a fisherman who conserves the common resource will benefit since he has no control over the harvest activity of other fishermen. But, the theory goes, if access is controlled through government or private ownership, the remaining users will benefit from their conservation efforts and so will not overexploit the resource.

A further elaboration on the concept of the "tragedy of the commons" is that the race to harvest the common resource leads to overcapitalization. Economists disapprove of overcapitalization because it ties up capital (money) in equipment that is idle for long periods of time, capital that could be used in more productive ways. Economists view this as contrary to the public good.

Economists believe that "increasing the rent from the fishery" or "rationalizing the fishery" (i.e., deriving "benefit") is in the best interest of the nation. Positive aspects economists associate with rationalizing the fishery include achieving: the least cost to catch fish, the least tied-up capital, and the lowest cost to consumers.

However, experience has shown fisheries managers that simply limiting the numbers of participants (i.e., limiting entry through moratoriums) is not sufficient to reduce overfishing and overcapitalization.

Vessel consolidation

The Atlantic Surf Clam and Ocean Quahog Fishery Management Plan (FMP) was initially approved in 1977. Over time, it established a moratorium to limit entry, set annual quotas, and limited the amount of time vessels could fish.

These measures, however, did not lead to reducing the size of the fleet; since fishing time could not be combined on one vessel, the only way a firm could increase its catch was to increase the efficiency of its vessel or buy additional vessels.

There was, however, a consolidation of ownership. According to Creed, in 1979, 89 firms each owned one vessel and 23 owned two to four. By 1988 there were 133 active vessels in the Mid-Atlantic surf clam fishery (160 in the combined surf clam/quahog fleet), with 41 firms owning one vessel, 10 firms owning two to three, and three firms owning 10 or more.

Today, there are 70 vessels left in the industry; more, Creed said, than she would have predicted by now. She has not yet analyzed how these are distributed among firms.

Since the original FMP did not effectively regulate catching power or efficiency, fishermen could and did enhance carrying capacity and the speed with which they caught clams. As vessel size and the catching speed increased, the number of hours of allowable fishing time was reduced to ensure that landings did not exceed the annual quota.

In 1979 each vessel was allocated 1,440 hours of fishing time during the year. By 1987 each vessel was allowed only 25 six-hour fishing trips annually (150 hours total). By this time over half the fleet was composed of vessels over 100 gross tonnage and fleet efficiency had grown tremendously.

The fleet's catch-per-unit-of-effort (CPUE) jumped from 26 bushels of clams per hour in 1979 to 190 bushels per hour in

1987. Besides improved efficiency, improved abundance of clam stocks contributed to the surge in CPUE.

The management plan was widely criticized because of "severe overcapitalization and high enforcement costs," Creed noted. A 1986 National Marine Fisheries Service (NMFS) Task Force report indicated that the efficiency of the fleet was so high that the entire annual Mid-Atlantic surf clam quota could be caught by only six vessels working year-round.

However, Elmer Widerstrom of Cape May, NJ, a former clammer who ran several boats as a hired captain, maintains that 99% of the clammers were "doing fine." He suggested that "greed" motivated the passage of Amendment 8 and that it was good for only a handful of people.

"The bigger the person, the better they came out. Eliminating all these boats eliminates jobs," Widerstrom said. "The little person got squeezed out, didn't get enough allocation to be able to continue. It's not the American way."

Unsolved problems

Managers hoped to fix a number of problems with the surf clam and ocean quahog fishery which were raised as the reasons for Amendment 8.

While ITQs did lead to the consolidation of vessels in the fishery, some of the problems intended to be solved still persist. And, some problems in the fishery were addressed without ITQs.

For example, economists suggest that ITQs create a market for access rights and generate "resource rent," thus providing more benefits for the public good.

But, in fact, the market for access rights was evident before ITQs were

See CLAM ITQS, next page

Clam ITQs

Continued from previous page

implemented, due to the moratorium on new permits. In 1984, the Mid-Atlantic surf clam permit was worth an average of $130,000. By 1988, the permit added $200,000 to the cost of the boat, vessel owners told Creed.

Since catching power was attached to vessels, consolidation of the fleet did not occur prior to the ITQ system, but consolidation of numbers of crewmembers did. People who owned more than one vessel were able to use the same crew on several because vessels were allowed to work only for short periods.

Safety was cited as another reason for developing a different management scheme. Since vessels were only allowed to fish for short periods of time, they often sailed in bad weather and occasionally overloaded their boats, leading to loss of life. Weather-related problems were resolved when NMFS changed the rules to allow clammers to fax in a cancellation and reschedule their lost time.

But even with ITQs the safety problem still exists. Now processing plants, based on their production and market demands, dictate when the boats fish, according to research conducted by Ken Beal of NMFS. Boats are forced to fish in bad weather to maintain their link with the processor who holds the allocation.

High enforcement cost was another reason cited for revising the FMP. However, enforcement is still a problem. Recently NMFS moved to implement regulations to make it more difficult for clammers to falsely claim their catch came from state waters, where there is no allocation, a practice that had reportedly become common among some vessels.

The time NMFS must spend in tracking landings and ITQ leases and sales is a cost to the nation. The NMFS regional director must approve all transfers of ITQ allocations, typically 50 per month, according to NMFS' Hannah Goodale.

Jobs lost, shares cut

Anthropologists McCay and Creed are still assessing the social impacts of ITQs in the sea clam fisheries. Of the 76 men they have interviewed, 27 (35%) are no longer working on clam vessels.

Despite everyone's efforts to remain in fishing, only six of these 27 are still commercial fishermen. Ten have found jobs ashore, five are unemployed, and three are retired. Perhaps the hardest hit were the hired captains who lost their jobs when the fleet was consolidated.

The share system has evidently been undergoing revision since the introduction of ITQs. In their interviews, McCay and Creed found that "when vessel owners began leasing and buying ITQ allocation, they passed these costs on to their crewmen."

For example, a clam allocation is leased at a cost of $4 a bushel. The market pays $8 a bushel for the harvested product. But the vessel owners pay shares only on $4 per bushel, so the cost of the allocation has been shared by the crew. A few vessel owners also reduced the share on the clams caught with their original ITQ allocation, which had been awarded by NMFS at no cost to the vessel owner.

Other vessel owners who have not yet changed their crew's share reported that they may have to do so in the near future in order to be able to sell their clams at prices competitive with the owners who have lowered their crew's share.

One large fleet owner now pays the same price per bushel for catching surf clams ($8) as for catching ocean quahogs ($3.75) despite the major difference in ex-vessel prices between the two. Though captains and crew find this change objectionable, they reportedly dare not complain because so

many former clammers are looking for work that they could be easily replaced.

Ken Beal reported that one owner of several vessels indicated that crewmen are earning about $20,000 less than before Amendment 8 was implemented. In addition, he found that some boats have cut crew size from five to three, so crews are working harder while earning less.

Owner reactions

In their survey of vessel owners, Creed and McCay found there were three main categories of reactions to the implementation of ITQs. Those in the first category feel the system allowed them to make better business decisions and gave them more control. Those in the second category believe the regulations have created an artificial business environment with the cost of business now being the cost of buying and/or leasing ITQs. Those in the third category feel the system has hurt them, creating conditions that will force them to sell out.

Owners comfortable with the ITQ system expect to remain in the fishery in a strong position, along with the others who are the "best of those who built the fishery," or they expect to be able to sell out for a high profit.

Those in the second category suggest that the ITQ system has created a market for the right to fish and will therefore attract speculators with no commitment to the fishery. In addition, they complain about the dislocation of crewmen and support service personnel.

Some of these vessel owners say the idea that ITQs benefit the public good by reducing overcapitalization is absurd. They point out that money tied up in debt for ITQ allocation is no freer for productive purposes than money tied up in vessels.

The third category consists primarily of smaller vessel owners who feel that the ITQ system requires large amounts of capital to remain competitive in the fishery. Some of these are also trapped in the fishery because the glut on the market for fishing vessels due to fleet consolidation precludes the sale of their vessels.

An 80' vessel with a $100,000 mortgage fishing with two crewmembers along with the captain probably needs an allocation of 30,000 bushels to survive, according to former surf clammer Ed Watson of Dennisville, NJ.

Watson said that with his history of stocking 24,000 bushels, he expected to receive 18,000 bushels under the original allocation formula, an amount he thought he could live with. But when all the manipulations were done, he ended up with 14,000 bushels.

"The reduction was more than I thought was fair," he said.

Watson now leases his allocation and has learned a new trade outside of fishing, but said he's "riding a guilt trip" because he's receiving more money from leasing his allocation than he would if he were running his boat.

Vessel owners agree that eventually there will be fewer processing firms and fewer independent fishing vessel firms. Those who survive will be the large firms and those with large quotas. Some believe only the vertically-integrated processors will survive and some believe that the consumer will benefit with a better clam product.

Tracking impacts

The surf clam/ocean quahog ITQ system is still new. The industry has probably not settled into a configuration that will last for any length of time. Eventually managers will have to analyze ITQs from a wide range of perspectives.

In determining if the most benefit for public good has been obtained from the fishery, researchers will have to include the monetary and non-monetary considerations to crew, captains, captain-owners, vessel-owners, processors, support personnel, and families in the fishery, and fishing communities, as well as enforcement costs and costs associated with implementation and tracking (NMFS services), etc.

To some vessel owners and processors, the ITQ system seems to be an improvement, affording greater predictability and control. A few vessel owners feel that the system has had little effect on their businesses.

But the costs of the program seem high to many crewmen and some vessel owners, in terms of both economics and social impacts.

Those in the fishing industry in the United States and around the world, NMFS, economists, and academicians are all watching the surf clam industry to see if the ITQ system is the solution to the "tragedy of the commons" or a new tragedy in the making.

Madeleine Hall-Arber

Who owns the clam resource allocations?

COMMERCIAL FISHERIES NEWS • NOVEMBER 1992 • 38

GLOUCESTER, MA - While the ITQ system for surf clams and ocean quahogs confers a form of resource ownership on those people holding allocation, figuring out who exactly owns how much of that resource is no easy task.

For 1992 the surf clam quota is 2,850,000 bushels and the quahog quota is 5,300,000 bushels. Rather than an actual number of bushels, ITQ holders own a percentage of the annual quota. The initial percentage allocations were issued to vessels owners based mainly on 80% of an adjusted two year vessel catch history modified by a 20% "cost factor" (vessel length x width x depth).

Once allocated, however, quota shares were no longer attached to a vessel. They could be sold, traded, or leased if the owner did not wish to use them. There is no limit on the number of ITQs one can own or lease.

Currently, there are 112 owners of surf clam quota and 78 owners of quahog quota, according to Myles Raizin of the National Marine Fisheries Service (NMFS) in Gloucester, which tracks all quota transfers.

Who owns the quota is public information, but because owners tend to create a new firm for each vessel, it is very difficult to determine how many vessels actually belong to a single individual or company.

Another factor which makes tracking of sales and leases confusing is that some allocations are held by banks in order to permit buyers to purchase allocations over a long term. Bob Ross of the NMFS Fisheries Analysis Division found that leasing is manipulated among owners and processors for tax purposes, further disguising true ownership or control.

NMFS "does not pierce the corporate veil," observed Joel MacDonald, an attorney with the National Oceanic and Atmospheric Administration. "As long as the official buyer conforms to regulations, there is no problem."

The largest quantities of quota are currently owned or controlled by Borden Inc., an American company headquartered in Columbus, OH. Snow Food Products, producer of the popular Snow's canned clam chowder, is a Borden subsidiary. Borden, which bought out American Original shortly after Amendment 8 was implemented, reportedly controls about 40% of the ocean quahog allocation and 25%-30% of the surf clam allocation.

Reportedly, some of the allocation that in NMFS' records appears under the ownership of National Westminster Bank, a British Bank which holds the mortgage on the American Original purchase, is actually under Borden's control.

Sea Watch International, a wholly owned subsidiary of a Nicherei, a Japanese company with other seafood interests on the West Coast and Alaska, is rumored to have recently bought 150,000 bushels worth of surf clams allocation, for an estimated $2-$3 million. This would appear to place Sea Watch as the fourth largest owner of allocation, although, again, it is difficult to tell.

Not surprisingly, other major owners or controllers of allocation reportedly include two other food company giants, General Mills and Campbell Soup Co. Campbell has exclusive agreements with J. H. Miles and Blount Seafood Corp. which own vessels and allocation.

There are almost no independent, single vessel owners left in the industry.

Little guy loses

Amendment 8 was implemented in October 1990. ITQ trading began in earnest in April 1991 after a federal court rejected two lawsuits filed by processors and vessels owners to stop implementation of the amendment.

By December 1991, ITQ prices were about 2.5 times the ex-vessel price of clams, researcher Carolyn Creed reported, although people in the industry had expected this to rise to about 4.5 times the price.

At the time, surf clam ITQs were worth about $17 a bushel, and quahog ITQs about $5-$6, according to Creed. Currently, fisheries business consultant Dave Wallace estimates that surf clam ITQs are worth about $25, quahogs $6-$7.

A number of early observers, such as Wallace and Creed, predicted that ITQ buyers would be companies with money from sources other than the fishery. A likely result would be the consolidation of ITQ owners and processing companies. Indeed, this prophecy is being fulfilled.

As Paul Carr, business manager for Guifford Associates in Atlantic City, NJ, a one-time owner of 20 clam vessels and current owner of one active clam vessel, pointed out, "It is the large corporations who have the wherewithal to play."

The major problem for small firms is that the allocation is only a right to fish, and NMFS does not allow it to be used as collateral for loans. Large corporations don't need to rely on their allocations to obtain financing, "they just write a check," joked Wallace.

Some of the large corporations do financ vessel owners or arrange for their banks to provide loans for allocation purchase in exchange for exclusive marketing agreements, according to former clam fisherman Ed Watson.

Vessel allocations, issued only to workin vessels, might have afforded the independen fishermen greater opportunities, such as making it possible to set up joint ventures with the major corporations.

Chances are that few major corporations would actually want to take on the risk of vessel ownership, Wallace said. By owning the allocation, the companies get their clam supply through contracting out with vessels, and never incur the risk associated with running vessels.

"Clams," Wallace said, "are just an ingredient to many of these food companies."

Madeleine Hall-Arber

THE PROVIDENCE JOURNAL-BULLETIN

A 4 FRIDAY, FEBRUARY 12, 1993

Borden charged with rigging milk bids to public institutions

WASHINGTON (AP) — The Justice Department charged Borden Inc., one of the nation's largest milk suppliers, and another dairy company yesterday with rigging bids in milk sales to schools and other public institutions.

Justice Department spokeswoman Gina Talamona said the charges were not directly related but were part of the department's nationwide crackdown on bid-rigging in sales of dairy products to public institutions.

"We estimate that the cost to consumers could be in the hundreds of millions of dollars," said Talamona. "It's been a widespread investigation, crossing many states."

So far, 37 corporations and 41 people have been convicted, and fines of $35 million and civil damages of more than $7 million have been imposed, the department said. The milk industry is still being investigated by 34 grand juries in 23 states.

Borden Inc. of New York was accused in federal court in Dallas of five felony charges stemming from five separate alleged conspiracies involving milk sold to some public school districts and public hospitals around Texas, plus Reese Air Force Base and Texas Tech University.

THE PROVIDENCE SUNDAY JOURNAL

MAY 23, 1993 A 3

Bids on milk contracts rigged

■ Executives of several companies have pleaded guilty to conspiracy in supplying schools and military installations.

The New York Times

Federal and state investigators have found evidence that companies in at least 20 states have conspired — sometimes for decades — to rig bids on milk products sold to schools and military bases.

So far, 48 people and 43 companies — including such industry giants as Borden, Pet and Dean Foods — have been convicted or have pleaded guilty to federal criminal charges of price-fixing and bid-rigging. At least $91.4 million in criminal fines and civil damages has been levied, and two dozen people have been sentenced to prison.

The cases follow a common pattern: Top regional executives arranged, usually by telephone but sometimes at gatherings at local restaurants, to divvy up the local milk business by deciding in advance who would submit the "low bid" for each school district and military base in their region.

As a result, students and military personnel, and the taxpayers who subsidize their meals, have overpaid for milk and ice cream, while dairy companies have reaped millions of dollars of artificially inflated profits. In a typical case, a federal prosecutor in Florida said the bid-rigging had raised milk prices by 14 percent.

At least 32 federal grand juries are involved in the investigation, which grew out of state investigations that started in the late 1980s.

"We've looked at other industries in the past, but we haven't uncovered anything like this," said Joseph H. Widmar, director of operations for the Justice Department's antitrust division.

More investigations under way

Widmar said the investigations would last at least another year, with more prosecutions expected.

Among the nation's largest dairies, Flav-O-Rich, based in Louisville, Ky., and six of its executives have pleaded guilty in seven states. Borden, its Meadow Gold subsidiary, and nine Borden and Meadow Gold executives have admitted rigging bids in six states. Pet, based in St. Louis, and the Land-O-Sun dairy unit of Finevest Foods in Greenwich, Conn., which purchased Pet's dairy business in 1985, have pleaded guilty in five states; seven executives who worked for Pet and Land-O-Sun have also pleaded guilty.

Southland Corp. and several top executives of its former Velda Farms dairy unit, along with two subsidiaries of Dean Foods, have pleaded guilty to rigging bids in Florida. And dozens of smaller regional dairies across the South, along with their top executives, have also pleaded guilty.

Speaking for the dairy industry, E. Linwood Tipton, president of the Milk Industry Foundation, said he believed the industry's local problems had been exaggerated by the "spotlight" of the federal prosecutions and state civil suits. "When there are enormous investigatory powers directed at you, it looks like a more abnormal situation than it probably is," Tipton said.

TESTIMONY OF SHARI GROSS

HALIBUT ASSOCIATION OF NORTH AMERICA

BEFORE THE

HOUSE SUBCOMMITTEE ON FISHERIES MANAGEMENT

FEBRUARY 9, 1994

Thank you, Mr. Chairman. I am Shari Gross and I am testifying today on behalf of the Halibut Association of North America (HANA), a trade association of virtually all halibut processors in Alaska, Washington, Oregon and British Columbia. HANA generically marketed halibut for forty years until five years ago when it realized that without advocates for conserving the resource there wouldn't be halibut to market. It amended its bylaws and has redirected its focus to management issues ever since.

I appreciate the opportunity to testify today on reauthorization of the Magnuson Fishery Conservation and Management Act (the Magnuson Act) and particularly, Individual Transferable Quotas (ITQs). My comments today reflect not only the views of HANA, but also my 30 years in the fishing industry.

During the long debate before the North Pacific Fishery Management Council over halibut ITQs, HANA mainly focused on the monitoring and enforcement aspects of the plan and its funding

and regulatory details because those are the components most critical to ensuring that this nation will enjoy its fishery resources in perpetuity. Unfortunately, they are also the components most easily and frequently simplified. I want to turn your attention to them today.

By all accounts, ITQ systems open the door to overfishing, high-grading and other forms of cheating and without a tight and necessarily costly enforcement program, the resource is put at risk. Imagine, for example, the difference between monitoring the halibut fleet for violations under today's system of two short openings and, next year, when the ITQ program begins and we will have 9000 vessels spread over a 34,000-mile coastline for nine months.

Given the competition for government appropriations, it stands to reason that if Congress elects to include provisions for ITQs in the Magnuson Act, it must also provide for appropriately high and sustainable funding sources. Unless the two are addressed in tandem, we will certainly end up the beneficiaries of a complex out-of-control program and a resource in jeopardy.

Throughout the halibut debate, HANA believed that the National Marine Fishery Service's zeal for an ITQ system drove them to design regs to fit a limited budget. Without question,

this is no way to protect the fishery and it is only a matter of time before we lose it.

If we are to have ITQ programs they must be tailored to offer the most protection, not to fit funding sources. And they also must benefit from access to the best information available about failures and successes elsewhere. We wondered why NMFS systematically denied us the advantage of learning from their own evaluations of the surf-clam ITQ program and why a national task force was at work developing a model program at the very moment when the North Pacific Fishery Management Council was considering the largest and most complex plan in the world.

We remain concerned that the monitoring and enforcement components of the plan are bare-bones and simplistic. And, as evidenced last week at the International Pacific Halibut Commission meeting, the Canadians are deeply troubled, also.

While HANA is all for finding economies in government programs, we believe there is no way an ITQ program can be done "on the cheap". The disparity between British Columbia's carefully planned and implemented halibut ITQ program -- its costs, its ability to assess industry, and its 100 percent coverage -- and our own program is too great to disregard.

We are hopeful that with Rollie Schmitten at the helm now,

the National Marine Fishery Service will work openly and honestly with the industry and Congress to design the best management programs for our fisheries. And if ITQs are the chosen method, everyone must understand that they are the Cadillacs of fishery management programs and ask whether we can really afford them over other alternatives.

As processors, HANA's members know full well that their bottomline remains conservation of the renewable fishery resources. We hope you share our concerns and will consider them during your deliberations. Thank you.

TESTIMONY OF WILLIAM R. ORR

GOLDEN AGE FISHERIES

BEFORE THE

HOUSE MERCHANT MARINE AND FISHERIES COMMITTEE

SUBCOMMITTEE ON FISHERIES MANAGEMENT

WASHINGTON, D.C.

FEBRUARY 9, 1994

Thank you, Mr. Chairman. I appreciate the invitation to appear before the Fisheries Management Subcommittee to discuss the issue of Individual Transferable Quotas (ITQs). I am Bill Orr, and I am the Chief Operating Officer of Golden Age Fisheries.

Golden Age Fisheries owns and operates five small to medium-sized factory trawlers ranging from 104 feet to 200 feet in length, and is a partner in, and manager of, a salmon processing facility on the Kuskokwim River in western Alaska. Golden Age Fisheries has also spent the past three years developing new product forms for the underutilized pink salmon resource. We employ about 450 employees on a full-time and seasonal basis.

Factory trawlers harvest only groundfish using trawl nets, then process, package and store the catch onboard. Golden Age Fisheries produces a variety of seafood products, including pollock and cod fillets, and flatfish products sold in the United States, Canada, and Europe. We also harvest and process a variety of flatfish species, such as rockfish, turbot, sablefish and Atka mackeral, which are sold in Asian markets, either frozen in the round, or headed and gutted. All of the product is frozen at sea within hours of being caught.

Golden Age Fisheries is also engaged in a partnership with seventeen western Alaska communities in the Community Development Quota (CDQ) program. The CDQ program is structured in such a manner, that a review of fishery operations under this system, provides insight into the benefits of implementing a comprehensive

ITQ program for the multi-species North Pacific groundfish fishery. My testimony decribes Golden Age Fisheries' experiences in the CDQ fishery, how our vessel operations and marketing strategies were adapted to this unique management structure, and how existing problems in the fishery are rectified under an individual quota system.

1. Background on North Pacific Groundfish Fisheries.

The North Pacific groundfish fisheries, like all fisheries in the U.S. Exclusive Economic Zone (EEZ), have been under federal control since enactment of the Magnuson Fishery Conservation and Management Act (the Magnuson Act) in 1976. These fisheries within the U.S. 200-mile zone are perhaps the richest fisheries in the world, accounting for over 40 percent of all U.S. fishery landings by weight. The Bering Sea pollock harvest alone is approximately 1.3 million metric tons (m.t.) annually. Federal fishery scientists determined that 2.8 million m.t. could be safely harvested in 1993, but harvest is restricted under the management plan to 2.0 million m.t. This restriction is a carryover from the management practice of imposing conservative harvest limits in an effort to hasten the phaseout of foreign fishing fleets. As a result of this conservative management, virtually all groundfish species in the North Pacific are high in abundance and healthy.

Congress amended the Magnuson Act several times to promote development of U.S. harvesting and processing capacity, and to

create market opportunities. Full "Americanization" of these vast fishery resources did not occur until 1990. Almost coincident with full "Americanization" was overcapitalization in both the harvesting and fish processing sectors.

Golden Age Fisheries evolved from Stan Simonson's fishing operations that began on the deck of his father's halibut boat. After years serving as a fishermen on the back deck of a variety of longline and trawl vessels, Mr. Simonson moved into the wheelhouse in the late 1970's during the advent of the joint venture fisheries. He purchased his first vessel, the Golden Fleece, in 1980.

Mr. Simonson participated in the first joint venture fishing operations, delivering his catch to Japanese, Russian and Korean processing vessels. As joint ventures wound down in the mid-1980's, Mr. Simonson could find no markets for his catch with the established American processors. Mr. Simonson then invested in the factory trawler *Rebecca Irene*, which was designed and built to help "Americanize" the groundfish fishery in the EEZ off Alaska; it served as both a joint venture delivery vessel and a catcher/processor.

In 1986, when I first entered the groundfish industry, there were approximately ten U.S.-flag factory trawlers. These vessels caught and processed less than 100,000 m.t. of groundfish among them; seasons for most species were open year-round. Most of the vessels were under 200 feet in length, and maximum production was

about 25 m.t. per day. There was virtually no shoreside processing of groundfish in existence at that time.

During the next few years, the fishery experienced exponential growth as numerous surimi factory trawlers entered into service. This growth was stimulated by enactment of the Commercial Fishing Industry Vessel Anti-Reflagging Act of 1987 and financed by foreign banks offering multi-million dollar interest subsidies and 110 percent financing. Dozens of massive vessels, capable of producing up to 100 m.t. of finished product per day, emerged from foreign shipyards into the North Pacific groundfish fishery.

By 1993, the at-sea processing fleetincluded more than 60 vessels, with a majority of the fishing power residing in factory trawlers over 250 feet in length. Last year, over 750,000 m.t. of pollock was taken in approximately 70 days by the at-sea fleet. In addition, four large onshore processing plants, most built within the past few years, handled about 450,000 m.t. of pollock during roughly a 90-day period.

Today, seasons are too short for most vessels to operate profitably. To compete, vessel owners must increase investment in processing capacity to make the most of the fewer available fishing days. This short-term strategy has left most operations one step ahead of foreclosure.

Unfortunately, Golden Age Fisheries is not immune to the problems facing the industry. Excess capacity in the pollock fishery, which resulted in shorter pollock seasons, also created a situation where vessels designed for pollock processing are now

moving into other groundfish fisheries traditionally prosecuted by smaller at-sea processing vessels. This shortens seasons for these fisheries, as well. The smaller vessels are hurt more by this circumstance, because they often lack the capability, as well as the capacity, to compete head-on with larger pollock vessels.

Larger vessels can operate close to breakeven for a longer period of time. However, even operators of large vessels, are threatened by the current downward economic spiral of bankrupt vessels being sold at auction for 30 cents on the dollar. These vessel reenter the fishery with low capital costs, undercutting long-term stable operators.

The failure of the North Pacific Fishery Management Council (the "Council") to impose meaningful limits on entry into the fishery is largely the cause of the current state of overcapitalization. The combination of overcapitalization and the open access race for fish provide the root causes of most of the problems affecting both the fishery and the industry. The Nation is not achieving the maximum benefit that it could realize from the fisheries, and the fishermen, who followed the course of action laid out in the Magnuson Act and "Americanized" the fishery, are now on or over the brink of economic disaster.

2. A Solution--Individual Transferable Quotas (ITQs).

The comprehensive, and obvious, solution to the current fishery managment problems in the groundfish fishery is implementation of an ITQ system. North Pacific Council staff

analysis and the National Marine Fisheries Service (NMFS) Alaska Region Director acknowledge that an ITQ program best addresses the fourteen major economic, social, and environmental problems identified in the fishery. However, the Council has proved incapable of acting in a timely and responsible manner to adopt an ITQ program.

Congress should act to ensure proper management of America's largest fishery. At a minimum, Congress should instruct the Secretary to implement a North Pacific groundfish ITQ plan. Other measures may be needed, as well, to ensure prompt development of an ITQ plan. The following comments illustrate the benefits of such an approach.

3. The Community Development Quota (CDQ) Program as a Pilot Program for ITQs.

In 1991, the North Pacific Council approved a management regime that allocated Bering Sea pollock and Gulf of Alaska pollock and cod between those who process at-sea and those who process onshore. The so-called onshore/offshore allocation plan was established as an interim measure, while the Council developed a market-based management regime. The onshore/offshore rule sunsets at the end of 1995.

One element of the onshore/offshore regime is the Community Development Quota (CDQ) program that I referenced at the beginning of my remarks. Under the CDQ program, 7.5 percent of the annual Bering Sea pollock quota (about 100,000 m.t. of pollock) is

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reserved for western Alaska communities. Six community groups formed to take advantage of this program and have been allocated a portion of the CDQ harvest.

Golden Age Fisheries is involved in the CDQ program with our partners, the Coastal Villages Fishing Cooperative (CVFC), a group of seventeen western Alaska villages in the Yukon-Kuskokwim Delta region. This partnership, the Imarpiqamuit Partnership, owns the factory trawler *Browns Point*, which is managed by Golden Age Fisheries. The *Browns Point* harvests and processes the CDQ awarded to CVFC.

CVFC was allocated 27 percent of the pollock available through the CDQ program, or about 27,000 m.t. Receiving a specific allocation of fish within the context of the CDQ program is similar to receiving a harvest share under an ITQ system. Each CDQ participant is allocated a share of the overall quota and can fish the quota, or sell the quota, at any time during the course of the year.

4. Benefits of an Individual Transferable Quota System.

Based on our experience in the CDQ program since 1992, we have identified significant benefits from participating in an individual quota fishery. Most benefits are attributable to the absence of a race for fish inherent in an open access management system.

a. Enhanced utilization of harvested fish. The philosophy of our operations changes from fishing in the open access fishery to fishing in the CDQ portion of the fishery. Emphasis shifts from

dollars per day to dollars per fish. Under the Olympic system, the goal is to maximize daily revenue by pushing the highest volume of fish possible through the factory, and retaining only those speices of highest value. If you don't catch the fish, the competition will, and your revenues will be reduced.

During the CDQ fishery, we are able to focus on maximizing the amount of revenue from each fish brought onboard. We are able to increase the amount of marketable product derived from each fish by taking more care in sorting the fish by size, adjusting the processing equipment, and undertaking more time-consuming tasks, such as hand trimming fillets.

We add more value to the fish during the CDQ portion of the fishery. For example, we are able to prepare onboard custom fillet products, such as layer pack and shatter pack, which command a higher price in the marketplace, but are too time consuming to attempt during the open access fishery.

We are also able to retain a wider array of species, including lower-valued fish that would be discarded during an Olympic fishery. Since we are attempting to maximize net revenue over the entire year instead of on a daily basis, we are able to take the time to process fish that yield a lower return.

b. Decrease in unwanted bycatch. The harvest of unwanted species, known as bycatch, has both conservation and management impacts. Bycatch, which exists in virtually every fishery, creates some of the most difficult management issues to resolve. It exacerbates frictions among fishermen targeting on different

species, or using different types of fishing gear. In the CDQ fishery, there is no pressure to harvest the target species in a rapid manner; therefore, fishing operations can focus on areas where bycatch of unwanted species is at a minimum. If the incidental catch of non-target species is too high, the vessel changes location, or fishing gear. Under open access, fishermen who alter fishing operations to avoid bycatch risk lost fishing opportunities, since other vessels continue to harvest the quota.

c. Improved market opportunities. Product from the *Browns Point* is sold to most major users of pollock, including McDonald's, Burger King and Long John Silvers' restaurants. We have been able to capitalize on our ability to produce "fresh", high-quality pollock block (compressed fillets) on a nearly year-round basis. We are able to plan our production schedule well in advance. In a tight market, the ability to provide product on a consistent basis is a definite advantage. Golden Age Fisheries delivers product to customers as they need it, and also spares us the high cost of holding inventory in cold storage.

One of the biggest problems of the current management regime is that it forces the fishing fleet into "pulse" fisheries that dump large quantities of product on the market at one time. This problem is particularly acute for the vessels producing headed and gutted flatfish, rockfish, and other species to Japan. In the past, when fishing occurred year round, these fish was harvested to meet demand, and prices were higher. Now, prices are drastically reduced, as markets are glutted within several weeks' time with an

entire year's production. Left to their own devices to harvest their individual quota, fishermen will arrange their fishing schedules to take advantage of market conditions.

d. Vessel operations--planning and efficiency. The ability to control when fish will be harvested offers the vessel manager the opportunity to make the most efficient use of the vessel's harvesting and processing capabilities. Important cost savings can be achieved, if some of the uncertainty and time pressures that currently exist, can be removed. For example, under an Olympic system, when a breakdown in equipment occurs, the urgency to maintain operations during an open fishery takes precedence over cost considerations. A vessel operator fishing in an ITQ fishery can afford to delay fishing activities, if a more cost effective remedy is available, but not immediately so.

These are just a few of the evident benefits of the individual quota program, in which Golden Age Fisheries participates. We anticipate additional benefits, if a comprehensive ITQ program is enacted for the North Pacific.

5. Expected Benefits of a Comprehensive ITQ Program.

a. Increased utilization of fishery resources. In addition to the improvements in bycatch management realized under the single species pollock CDQ program, additional gains can be realized with implementation of a comprehensive multi-species ITQ program. Current management regulations require the discard of valuable species, ostensibly to better track harvest amounts. Currently,

fishermen are required to discard halibut when fishing for sablefish, and to discard sablefish when fishing for halibut. Other similar examples of the existing ridiculous regulatory regime exist. Under an ITQ program, bycatch could be managed on an individual vessel basis, with federal observers aboard every groundfish vessel, and quota readily transferable to reduce the likelihood that valuable species would be discarded.

An ITQ program is also likely to spur development of new products and markets. The present system has left so few companies profitable that the industry does not have the resources to commit to product and market development projects. Returning the industry to health under an ITQ system will allow for long-range planning initiatives, and the Nation will realize greater benefits from its resources.

b. Rational reduction of capitalization in the fisheries. Implementation of an ITQ program is the most rational method for reducing capitalization in the North Pacific groundfish fishery. ITQs transfer value from assets, such as fishing vessels, to share quota. Those individuals choosing to sell their quota share will be able to exit the fishery whole, or nearly so. The economic incentive for those remaining in the fishery is to utilize only as much fishing and fish processing capacity as is needed to prosecute the fishery as dictated by market conditions.

Currently, all of the investment and most of the research in new harvesting and processing equipment is focused on increasing the volume of fish through the factory. The change in philosophy

engendered by an ITQ program will shift that investment toward improving the quality and value of fishery products. The Bering Sea pollock fishery illustrates this case.

There have been very few new vessels entering the fishery since 1991. However, the fleet harvests over 10,000 m.t. more pollock per week now, than two years ago, an increase of about 15 percent. This is a result of "capital stuffing." Fishermen employ bigger nets and larger horsepower engines on vessels. Processors upgrade their equipment to process more fish per hour. As long as the economic incentive exists to adapt operations to catch and process faster, overcapacity will continue to plague the industry, even if some vessels exit the fishery.

This environment favors those operations that are most easily upgraded, if anyone is favored at all. Smaller vessels that have little room to expand their capacity are the first casualties in this battle.

The rest become casualties later, because there is no certainty that vessels will exit the fishery, as long as the race for fish creates an economic incentive to deploy excess fishing and fish processing capacity. In 1993, four factory trawlers were forced to declare bankruptcy. Three of the four are back in the fishery, and the other will likely return soon. The Puget Sound region is experiencing significant economic and social disruption as the collapse of a major economic force leaves creditors reeling and the vessels--sold at auction for thirty cents on the dollar--

returning to the fishery with lower capital costs than the original entrants into the fishery.

c. Increased safety and job security for crew members. There is an obvious correlation between enhanced safety and employing a trained and experienced crew. An ITQ program, which restores economic and social stability to the industry, provides job security for crewmembers. A company's ability to retain trained and experienced workers is directly tied to its ability to offer secure, long-term employment.

Presently, most of the 6,000 crew members employed in the groundfish fishery are fearful that the next week will be their last in the industry, that their opportunity will disappear along with the company for whom they are working. This situation does not encourage employees to further their education and training, or to improve their skills. It does encourage them to look for another line of work.

With an ITQ program, employees will have set schedules, a predictable and lucrative income, and confidence that their jobs are secure. The premium placed on highly skilled, well-trained employees will increase, and the professionalism of fishing crews will likely improve. Crewmembers will have an incentive to enter training programs to take advantage of opportunities for advancement. These are important benefits for crewmembers that should not be overlooked.

d. Resolution of allocation disputes. Recent North Pacific fishery allocation disputes have been controversial, have created

uncertainty among, and instability within, industry sectors, and have exacted substantial economic and social costs among workers in the fishing industry and in the supply network. The Council spent three years and millions of tax dollars imposing allocations that are mere half-steps, and fail to address the root problems in the industry. This has drawn the Council's attention away from its real charge, managing the resource. Little time or effort is now spent addressing how best to maximize the return to the Nation from the fishery. Instead, time is spent trying to determine how to best allocate resources to user groups favored by the Council.

At the same time, the Commerce Department maintains that it is not the federal government's role to determine winners and losers in the fisheries, that the marketplace should determine that. However, regulatory actions, to date, have not reflected the Commerce Department's policy statements. In fact, the existing onshore/offshore regulatory regime approved by the Commerce Department at the behest of the Council is intended to frustrate the market system as best it can.

Summary.

The Commerce Department must redouble its efforts to promote an ITQ program for the North Pacific groundfish fishery, perhaps at Congress' direction. As stated above, analysis, to date, confirms that twelve of the fourteen identified problems in the North Pacific groundfish fishery are addressed by implementation of an ITQ program. No other alternative addresses even half that many

problems. Yet, just last month, the Council voted to put consideration of an ITQ system on the back burner, despite years of industry demands for action.

An ITQ system, in which quota shares can be freely sold, purchased, and leased, resolves existing allocation disputes, and provides a mechanism for addressing the chronic problem of overcapitalization. This approach also provides important benefits in the areas of resource utilization, product marketing, worker safety, and job security. Congress must insist that the Department of Commerce fulfill its responsibilities in ensuring proper management of our Nation's fisheries resources. In order to achieve the goals of the Magnuson Act, a permanent, fair and rational market-based allocation system must be put in place.

STATEMENT OF MR. JOHN IANI

My name is John Iani. I am a Vice President of Unisea Inc., a major North Pacific seafood processor. Our company is based in Redmond, Washington, where we employ approximately 500 full time workers who are engaged in processing surimi seafood products as well as other species from the North Pacific. We also employ another 1,500 workers on a seasonal basis. Our annual sales are in the $120 million range. Since our headquarters is located in the First Congressional District of Washington, and since Congresswoman Cantwell has toured our facility, I am hoping that she will protect me from any harsh questions by my former employer, Congressman Young.

I should also point out that prior to joining Unisea I was the President of the Pacific Seafood Processors Association. PSPA is a trade association comprised of the largest seafood processing companies in the Puget Sound region. The organization has been in continuous existence for the past 79 years representing the interests of the Seattle-based fishing industry. During my tenure at PSPA I sometimes felt as if I were an original employee of the group.

My comments today represent the views of Unisea and not of PSPA, although I'm sure that many PSPA members would agree with much of my testimony.

Given the extreme complexity of the Individual Transferable Quota issue (ITQ - or Individual Fishing Quota/IFQ, as some prefer) it is probably best to begin my testimony with a simple statement of the obvious. Neither Unisea, nor any other groundfish processor within PSPA, will accept an ITQ system in the North Pacific under which we are excluded from the initial allocation of quota shares. To do so would be the equivalent of a member of this Subcommittee agreeing to run for re-election without having your name printed on the ballot. We will not agree to ground rules under which we have guaranteed our demise before the game has even begun. Neither would you.

I'm sorry to say that most of the rest of my testimony today lacks the clarity of the statement I just made. There are probably as many opinions and views on ITQ's as there are fishermen and processors in the fishery. Similarly, there are more unknowns than knowns in discussing ITQ's for any fishery, but especially one as complex and as valuable as North Pacific groundfish.

Even if the industry were united behind the idea that an ITQ system is the answer to the problems of waste, bycatch and overcapitalization, this still leaves hundreds of other questions unanswered. Among these are the policy questions enumerated in the

letter of invitation to this hearing. There are also practical questions such as who is eligible for shares and on what historic basis? Will there be limits on ownership and transferability? What fees and assessments will be charged? What about an auction system and who would be eligible to participate? How will a system covering such a huge geographic area be enforced? These are the types of fundamental questions which must be answered, but there are a multitude of others right down to the ultimate question for any boat owner or processor: what will my share be and what will it be worth? I have attached to my testimony a document recently prepared by the North Pacific Fishery Management Council on ITQ's for groundfish and crab. This is the outline of the issues which had been identified by the Council as of its January 1994 meeting. If you look through this document you will begin to appreciate the complexity of this issue and the monumental task faced by the Council, or any other group which takes on the job of crafting an ITQ system for this fishery.

I will now attempt to provide some specific answers to the questions posed in the Subcommittee's letter of invitation. First, as I'm sure you are aware, there are no "right" or "wrong" answers to most of these questions. The answers are almost always dependent on which fishery you're discussing and what your role is in that fishery.

The advantages and disadvantages of ITQ's will vary from fishery to fishery and ITQ's are definitely not appropriate for all fisheries. The primary theoretical benefit from the imposition of ITQ's in any fishery is that the creation of a private property right should make the "owners" of the fishery resource act more rationally and responsibly in the way they prosecute the fishery. Waste should be reduced, and quality and productivity should increase. Costs of operation should also be lowered. Also, in theory, the imposition of ITQ's should enable the orderly decapitalization of an overcapitalized fishery. In essence, the government, through the awarding of valuable ITQ shares, is providing the seed money (or collateral) which will enable participants to buy each other out and reduce the total effort in the fishery.

Another theoretical benefit is improved safety by enabling fishermen to choose when to fish. This is applicable in fisheries where the resource is available for many months and primarily those in which smaller vessels are used.

The next question deals with necessary legal changes which either facilitate or restrict Council action on ITQ's. I'm not sure that anything should be done to restrict Councils. Right now they have broad authority to explore a variety of effort limitation systems. I believe they need this authority.

In terms of legal changes to facilitate Council action, there is a minor clarification we may need if the North Pacific Council is to have access to the full range of ITQ options which have been identified. The NOAA Regional Council in Alaska has issued an opinion that it may be illegal for a Council to award ITQ shares for processing to onshore processors. The opinion states that ITQ shares for harvesting may be awarded to anyone, whether they are engaged in the fishery or not. However, for processing, the opinion interprets the Magnuson Act to mean that only at-sea processors fall under the definition of "fishery". The NOAA opinion argues that the Magnuson Act does not provide authority for the regulation of onshore processors. We feel that while this may have been the case in 1976, there have been significant legislative, judicial and regulatory changes in the interim. Onshore processors are now subject to federal permit requirements, federal reporting requirements, and the requirement to have multiple federal observers. We were also intended to be the beneficiaries of the "Processor Preference Amendment".

It is our opinion that from both a legal and practical point of view it is incorrect to continue the notion that onshore processing plants are not a part of the "fisheries" of the United States and fall outside the scope of the Act. Nevertheless, this NOAA legal opinion is a potential impediment to resolution of the groundfish ITQ dilemma in the North Pacific. This obstacle should be removed in order to provide the Council with the full range of ITQ options.

Questions 3 asked about the need for ITQ-specific amendments to the Act. Again, I'm not sure that any such amendments are necessary given the fact that any ITQ system would already need to comply with all provisions of the Act and other applicable law.

The major challenges to the National Marine Fisheries Service in implementing ITQ's will be related to data and enforcement. The process of awarding and tracking ITQ's, especially for a large fishery, is extremely complex. The Agency will need far greater data processing capacity than it currently has. As for enforcement, not only NMFS, but also the Coast Guard, will be hard pressed to monitor the activities of the entire groundfish fleet. This is especially true since they will also be required to enforce the halibut/blackcod ITQ system which is now being implemented. I don't believe the necessary resources are there at this time.

As far as management burdens are concerned, any ITQ system will, as I have just indicated, greatly increase the workload for those in the data management and enforcement areas. These responsibilities rest primarily with the Regional offices. It could be, however, that the management and policy staff in Washington, D.C. could be cut back since there would be less need for in-season management decisions and policy reviews. However, in sum, the management burden will likely increase.

Determination of the economic and social costs and benefits of ITQ's cannot be predicted and can only be determined after extensive study by both Council and NMFS personnel with major input from industry. As we saw in the case of the inshore/offshore allocation, there were continual requests for new and additional studies regarding economic and social costs and benefits. It was during the review of inshore/offshore that NMFS first decided to require a quantitative cost/benefit analysis. This new policy will certainly carry over to the debate on ITQ's and it is one of the main reasons why the Agency has said that implementation of a groundfish ITQ system will take at least two years after the Council finishes its work. It was, at least in part, this lengthy time horizon which recently drove the Council to look at a much simpler license limitation system as a possible solution to groundfish overcapitalization in the North Pacific.

I would now like to move on and make some observations regarding the specific situation we face on groundfish in the North Pacific region. There is no doubt that this fishery is overcapitalized and one of the favorite pastimes of the U.S. fishing industry is trying to assess blame for whatever problems we currently face. The usual targets are the National Marine Fisheries Service, the Regional Councils, Congress, or other segments of the industry, who are accused of fouling things up through inaction or the wrong action. Things were much simpler ten years ago when we still had the foreign fleets to blame. In the case of North Pacific groundfish, however, the blame inescapably falls on the industry as a whole. The North Pacific Fishery Management Council and the industry foresaw the problem of overcapitalization in the mid to late 1980's. The Council, through its Future of Groundfish Committee (FOG) came to the industry and asked if there was a consensus for action on a system to limit entry into the fishery. There was indeed a consensus within the industry, but that consensus was for inaction. Virtually no one supported Council action on any type of limited entry plan. This includes us, it includes the harvesters, and it includes the factory trawl fleet. AFTA's opposition is significant since they are now the main ITQ promoter. I have attached to my testimony a 1988 letter from the Alaska Factory Trawler Association (now the American Factory Trawler Association - AFTA) to the FOG Committee which states that "AFTA has determined that it does not favor limited entry in any form and supports the status quo as its preferred alternative." The letter goes on to say that "we urge the Committee to recommend to the Council that the current management system of open access be continued for all fisheries in which our members participate." Attached to this letter is the transcript of an exchange between two Council members, Bob Alverson and Oscar Dyson, and AFTA representative Vince Curry, who was appearing before the Council in 1989. In his testimony Mr. Curry noted that the Council had a formally adopted management objective under which "the Council will develop measures to control effort

into the fishery, including systems to convert the common property resource to private property, but only when requested to do so by industry." He went on to say that as far as AFTA was concerned "in our view we don't see a major request from industry for us to engage upon this path." At this point, Bob Alverson pointed out that without limited entry the fishing seasons would keep getting shorter and that "these type of pulse fisheries, in my opinion, will create shoreside instability, the very thing that shoreside people don't want to see. As well as, what I'm fearful of, is a great deal of instability in the at sea floater operations. Does AFTA's position ... do the members recognize that that is a downside risk that the Council and the fleet is heading towards without limited access?". AFTA's response was: "The answer to your question, I guess, is yes we are aware that this is a problem. Everyone is concerned. I don't have the solution of what is going to occur. There is going to be some pain suffered."

Mr. Dyson, in a follow-up question, then warned AFTA that in lieu of limited entry the Council was likely to move toward some type of fishery allocation plan to separate the onshore and offshore fleets. He asked if AFTA was will to accept that. The answer was no. It was shortly after this meeting that the Council began work on what became known as the inshore/offshore allocation.

The point of all this is that the problems we face today are not the result of lack of foresight; everyone knew that the fleet was likely to overcapitalize to some extent. Inaction resulted from the unwillingness of the industry, including us and AFTA, to support a plan which would stop the entry of new boats. Some of us thought that the Anti-Reflagging Act passed by Congress would serve that purpose, but given the Coast Guard's extremely loose interpretation of that Act's grandfather provision virtually anyone who wanted to bring a vessel into the fishery was permitted to do so.

AFTA's position at the time isn't surprising. They knew there were more boats in the planning stage, many of them owned by current AFTA members. It was like holding the elevator open because there was always one more person running towards it. The result was that the elevator became so full that it ended up going down instead of up. That's the position AFTA found itself in around 1991 or 1992. The arrival of new vessels began to be met with groans instead of cheers. Everyone knew there was too much capacity for the fishery. As a shore plant our only option was to seek an allocation system which would provide us some insulation from the inevitable collapse of the factory trawl sector. That collapse is now occurring and is likely to get worse.

The question now is: will an ITQ system, or some other management scheme, prevent continuing bankruptcies. The answer is no. The fleet will continue to consolidate, whether from

bankruptcy or because boats seek opportunities in other parts of the world.

The argument is made that issuance of ITQ's would promote a more orderly consolidation of the fleet. This is probably true. People who are awarded ITQ's by the federal government would be able to use that government subsidy to purchase the shares of failing companies. Although the vessels themselves are, for all practical purposes, worthless, ITQ shares are extremely valuable. Companies which would otherwise go broke would be provided, courtesy of the federal government, the opportunity to recoup their investment by selling their newly awarded ITQ shares. This, in turn, would provide the Norwegian and other foreign lending institutions which financed these vessels an opportunity to get back the money they lent to finance the original construction. It is up to Congress to decide, from a public policy point of view, if this is the best way to decapitalize the fleet.

Coming back full circle to my opening comment, I want to again emphasize that if there is to be a government funded buyout program for this fishery we want to participate. It would be grossly unfair for the federal government to implement a management system whereby they provide subsidies worth hundreds of millions of dollars only to certain participants. As Dr. Lee Anderson, the recognized expert on ITQ's, has said, anyone who has invested in pollock processing capacity and who is not compensated by the government under an ITQ system is doomed to failure. Our company alone has invested $150 million in plant and equipment to participate in this fishery. If our competitors receive ITQ shares and we do not then this $150 million investment will be taken from us with the support of our own government. Obviously, we will not stand by and let this happen. And as a major employer in the Puget Sound region and Alaska we would hope that Congresswoman Cantwell, Congresswoman Unsoeld and Congressman Young would all agree that equity requires all segments of the fishery to be included if an ITQ system is developed.

This concludes my prepared testimony. Thank you for the opportunity to appear today.

TESTIMONY BEFORE
U.S. HOUSE OF REPRESENTATIVES
SUB-COMMITTEE ON FISHERIES MANAGEMENT

HEARING ON
THE USE OF ITQs AS A TOOL FOR
FISHERY MANAGEMENT AND CONSERVATION
FEBRUARY 9, 1994

LEE G. ANDERSON
PROFESSOR, UNIVERSITY OF DELAWARE
& CHAIR, MID-ATLANTIC FISHERY MANAGEMENT COUNCIL

Good afternoon, my name is Lee G. Anderson and I am a Professor of Economics and Marine Studies in the College of Marine Studies at the University of Delaware. I am also Chair of the Mid-Atlantic Fishery Management Council, although the views I will present today are my own and do not necessarily represent those of the council. I am a fisheries economist and I have devoted my career to the study of fisheries management. I have been studying individual transferable quotas (ITQs) for over a decade. I worked on the implementation of ITQs in New Zealand and Australia and I was Chair of the Surf Clam Committee of the Mid-Atlantic Council during the period when ITQs were introduced. I also consulted with the North Pacific Council while they developed the individual quota program for halibut and sablefish.

In the brief time allotted, I will discuss the potential use of ITQs in modern fisheries management, and will answer some of the questions posed by the Committee. I have submitted for the record a copy of the overview document of the National ITQ Study which was sponsored by the National Marine Fisheries Service. The purpose of that study was to provide councils with unbiased background material on ITQs as they considered various management options. It contains much more detail than I can provide today and I hope it will be useful to the Committee and Staff. The four other volumes of this study are available from NMFS and I recommend them as well.

An individual transferable quota regime is a program where harvest rights to shares of a biologically determined total allowable catch are distributed to industry participants. Sometimes other regulations such as nursery closures are a necessary part of an ITQ program to insure that conservation goals are met. Although they have been implemented in about 30 fisheries around the globe, they are a significant change from traditional open-access regulation. It is important to realize, however, that property rights are the foundation of our free market economy and are the basis of literally all other natural resource management in this country including rangeland, water, minerals, petroleum, and forests. What is new in fisheries with ITQs has been commonplace with other resources for centuries.

There are two main benefits of ITQs. First, a quota based management system is better suited to achieve conservation on a consistent basis because it directly limits the amount of catch.

Traditional open-access regulations such as gear restrictions, closed seasons, and closed areas limit the way individual participants may operate, but they provide only a very loose cap on total harvests. Besides being a less than perfect way to limit harvest, these restrictions can have untoward effects on harvesting and processing costs, bycatch levels, and crew safety. It is difficult to set the individual limitations such that total fishing mortality is restricted to the desired level. In addition, increases in the number of participants and technological change require constant adaptation of the restrictions to keep total mortality in check. At the extreme this leads to "derby fisheries" where TACs must be taken in seasons measured in days or hours.

In combination with the firm cap on harvests, ITQs also support conservation by providing incentives for ITQ owners to recommend sustainable total quotas and to support strict enforcement because the value of their ITQs depends upon the health of the stock.

In addition to the conservation benefits, ITQs also tend to reduce administrative detail and to increase operator flexibility. Because the regulation focuses on how much is caught not on how it is harvested, managers do not have to meddle in the day to day operations of individual operators. This lowers government costs and allows participants to decide how to operate so as to reduce costs and increase market value. On an industry-wide basis, this translates to a harvesting and processing capacity more closely aligned with the average annual productivity of the stocks. Consumers also benefit from fresher and better quality fish.

There are other benefits of ITQs which are particularly relevant given the problems currently facing East Coast fisheries. Because most stocks are over-fished, the councils are instituting control dates and vessel moratoria. While these programs do provide for the reduction of fishing mortality on various stocks, (although the programs taken together can become very complex if area or time closures, and gear restrictions are used) they tend to place participants into small boxes which reduces the flexibility necessary to operate profitably. It also forces participants which do not meet the moratoria criteria to move to those fisheries with no entry limitations which can exacerbate management problems in those fisheries. A comprehensive ITQ program, on the other hand, could achieve conservation in all fisheries while still providing flexibility. The limits would be on total mortality of each fish stock not on which boats could operate in each fishery and how, when, and where they could fish. The boats would be free to accumulate the rights to harvest the types and amounts of various species which are best suited their needs.

ITQs could also play an important part of rebuilding programs for over-fished stocks. In order to allow stocks to grow, fishing mortality has to be reduced, sometimes by very large amounts for long periods of time. This can place a heavy burden on existing participants. What are they supposed to do in the meantime and how can they obtain the benefits of renewed stocks if they are forced out of business? If participants are given ITQs based on a

percentage of the total allowable catch, they will have the opportunity to operate the best they can during rebuilding or to sell their rights and to leave the fishery with some compensation. Participants will have incentives to stick with the rebuilding plan because they will reap the benefits from the restrictions during the lean years. The bottom line is that ITQs can help achieve conservation goals and at the same time can provide financial assistance to participants during rebuilding. In addition they can help to insure that those who bear the costs of rebuilding can achieve some of the benefits. And what is very important during a period of tight government budgets, the financial assistance can be provided without government subsidies or grants.

There are potential drawbacks to ITQs as well. Highgrading, the complexities of use in multi-species fisheries, and enforcement costs are among the most frequently mentioned. The background document I furnished provides a detailed discussion of the realities of these and other drawbacks in real world fisheries. Given the time constraints it will not be productive to summarize those arguments here. The point is that all management techniques have potential shortcomings. There is no perfect system. I do not think that the issue today is who can provide the longest list of advantages or of shortcomings of ITQs. Rather it is a question of whether an ITQ system which is properly designed and implemented for a particular fishery has the potential to better achieve conservation, distribution, and efficiency objectives than does the system currently in use. I believe that for many fisheries ITQs have that potential.

I support a change in the Magnuson Act which would allow Councils, should they desire it, the opportunity to impose annual fees on ITQ owners or to use auctions or other means of tendering quota. This would allow the general public to be compensated for the transfer of public resources into private hands and to prevent potential windfall gains. I would caution, however, that fees should be explicitly announced from the start so that prospective purchasers have a clear understanding of future cost liabilities. Instituting fees on an ongoing system would unfairly destroy the capital value of quota holders. Also fees should be related to the efficiency gains made possible by ITQs and their size should be carefully determined taking into account the variability of fishery profits due to changes in prices, health of the fish stocks, and sometimes international exchange rates. In addition the fee structure should be designed so as to not inhibit owners from searching for more efficient ways to harvest, process, and market fish products.

It would also be beneficial to amend the act to insure that Councils consider two critical issues as they deliberate ITQs. First, it is important to realize that the financial distribution aspects of the initial allocation of quota goes beyond merely who gets the harvest rights. Participants in all aspects of the industry can be affected. In an over-capitalized fishery where there is more harvesting and processing capacity than is necessary to utilize the TAC and where the capital is specific to that

industry, those who do not receive quota can suffer decreases in the market value of their capital. In order to insure an equatable initial allocation, all segments of the industry, including processors, should have an equal opportunity to obtain quota.

Second, the nature of the harvest right is very important to the success of an ITQ program. The security of the future claim on the productivity of the fish stock is critical for ITQ owners to have the incentives to conserve the stock and to undertake activities that will lead to efficient harvesting, processing, and marketing. Therefore if councils implement ITQ programs it is critical that everything be thought out well in advance and the lessons that have been learned from other existing programs be carefully evaluated. While it is necessary to make corrections for significant mistakes, extreme care should be taken to avoid unnecessary fine tuning. It is especially important that quota owners be protected from after the fact changes which directly affect the nature of the right. For example if owners fear that new entrants will be granted a share of the TAC, or that user fees or changes in reporting or enforcement requirements will be introduced, the beneficial incentives that an ITQ program can offer will be diminished.

I believe any changes in the law to limit the application of ITQs would be counterproductive. While lTQs may not be suitable for all fisheries, restrictions on their use could prevent their adaption where they may produce beneficial results. The national standards and other parts of the act (including the public hearing process) as well as other applicable law already provide ample safeguards against the indiscriminate and unwise use of any management regime including ITQs. I believe the councils should not be forced to implement certain types of plans or prevented from using others. They should be able to consider the full range of management options so that they may have every opportunity to select the one which best achieves the purposes of the Magnuson Act.

Thank you for inviting me here today and I will be pleased to answer any questions the Committee may have.

Consideration of the Potential Use of Individual Transferable Quotas in U.S. Fisheries

Volume 1
Overview Document

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March 13, 1992

The National ITQ Study Report
- Volume 1 Overview
- Volume 2 North Pacific Groundfish Trawl Fishery
- Volume 3 Gulf of Mexico Shrimp Fishery
- Volume 4 South Atlantic King and Spanish Mackerel Fishery
- Volume 5 Atlantic Scallop Fishery

Material in this Document draws from Volumes 2-5 of the ITQ Study Group Report. Comments and assistance from Wade Griffin, Daniel Huppert, Wally Milon, Jon Sutinen, and Rebecca Metzner Seter are gratefully acknowledged.

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FOREWORD

The fisheries of the United States are an extremely valuable heritage. In recent years, the marine fishing industries, both seafood and recreation, and allied enterprises have contributed over $24 billion annually to the nation's economy. In addition, the opportunity to fish recreationally adds to the quality of life for about 17 million Americans, and there are economic benefits from subsistence fishing, aquaculture, and recreational "fish watching" (U.S. Department of Commerce, Our Living Oceans, 1991). The National Oceanic and Atmospheric Administration (NOAA), in the U.S. Department of Commerce, has stewardship over the nation's fisheries and other living marine resources.

These same fisheries, however, are increasingly being depleted. Overfishing, especially, is a national problem that not only threatens fishery resources, but also results in a large economic waste. Restoration of overfished resources could account for significantly greater economic benefits; for example, in New England the value of fisheries production could be increased by $350 million annually and 14,000 jobs could be recovered if depleted groundfish stocks were restored (Massachusetts Offshore Groundfish Task Force, 1990).

It is therefore critical that management of the nation's fisheries turn toward systems that will rebuild overfished stocks and maintain currently productive ones. One way, used successfully in other nations, is the conversion from open access to controlled access fisheries: defining "property rights" through such techniques as Individual Transferable Quotas (ITQs). The 1990 implementation of the first U.S. ITQ program for Atlantic Surf Clams and Ocean Quahogs and subsequent intense interest by the Regional Fishery Management Councils in controlled access processes led to NOAA's sponsorship of the four studies presented in this series, the National ITQ Study Report.

The purpose of the studies, which used four very different U.S. fisheries as examples spanning a wide range of situations from those conducive to problematic to ITQs, is to explain the general principles of ITQs and to show how they might be applied to specific fisheries. The studies are not plans; they are intended only to help guide the Councils as they address controlled access issues. They offer few recommendations and no allocation schemes, and they do not advocate ITQs over other controlled access systems, since other alternatives were not examined.

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EXECUTIVE SUMMARY

1. The ITQ (Individual Transferable Quota) Study Program was organized to present information on the principles of ITQ management and on how those principles can be applied in the construction of ITQ programs for various fisheries. Separate teams consisting of individuals from NMFS, Councils, and Academia were selected to study the North Pacific Groundfish Trawl Fishery, the Gulf of Mexico Shrimp Fishery, the South Atlantic King and Spanish Mackerel Fishery, and the Atlantic Scallop Fishery. Between them these fisheries contain most of the problems faced by fisheries managers today. Therefore, many of the results of the studies will be applicable to other fisheries as well.

2. ITQs are a management device where a total quota is divided into small parts and allocated to individual participants. These individual shares can be bought, sold, and leased so that the individuals have flexibility in planning their fishing activities.

3. The total quota addresses issues of long term productivity of fish stocks, and the individual quotas provide incentives to match harvesting capacity with stock productivity, to produce a quality product, and to protect participants' long term interests by cooperating with enforcement efforts.

4. Potential advantages of ITQs include increased profits, greater economic stability, improved product quality, improved safety, reduced gear conflicts, elimination of the race to fish, by-catch reduction, reduced gear losses, an improved investment climate, mitigation of market gluts, and reduction in post-harvest waste.

Potential disadvantages of ITQs include increased high-grading, under-reporting of catch, enforcement costs and problems, creation of a rich man's club, changes in the make up of the fishing industry, and potential inequities of the initial allocation of quota. A more detailed general introductory analysis of points 2, 3, and 4 can be found in the Appendix.

5. There are several basic issues that have to be faced when developing an ITQ program. They include:

Nature of the property right
Management units
Determination of total allowable catch
Monitoring and enforcement

Need for other regulations

Initial allocation

6. There are many options for addressing each of these issues. There is no one option that will always work best for all fisheries. The option that will work best will depend upon the biological, economic, and cultural aspects of the fishery for which the ITQ program is being developed as well as on the management objectives of the Council.

7. Restrictions on ownership and transferability of ITQs normally increase program complexity and reduce the individual participant's flexibility. If such restrictions are to be considered, it is important to insure that the trade-off in terms of other fisheries management objectives achieved is worth the costs of increased complexity and the reduced gains from the restricted flexibility.

8. ITQs may not be appropriate for all fisheries. Like all fisheries management regimes, they have their shortcomings. The fundamental question is whether or not an ITQ program which is specifically designed for a particular fishery can achieve the management objectives of that fishery better than any other type of management. The purpose of the four studies is to lay the groundwork for designing ITQ management programs so that such a comparison can be made. The Executive Summaries of the studies are provided in Section V of this document.

I. INTRODUCTION

In July of 1991 an ITQ (Individual Transferable Quota) Working Group consisting of participants from NMFS, Councils, and Universities was organized under the direction of Dr. William W. Fox, Jr., the Assistant Administrator for Fisheries, NOAA. Its purpose was to help explain both the general principles of ITQs and how they might be applied in specific fisheries. The motivation for forming the group was to make sure that the very best information on this relatively new type of fisheries management was available to Councils as they developed new plans and amended others. Although there has been considerable discussion and much writing about ITQs, most of it has been quite general. Thus, one goal of this study was to summarize this material. However, the most important objective was to take the next step and to apply the basic principles by investigating how ITQ programs could be developed for different types of fisheries.

The group, which was under the overall chairmanship of Lee G. Anderson, of the University of Delaware, consisted of the four teams listed in Table 1, each of which focused on a particular fishery. The entire group met in August to finalize a common study procedure. While all teams agreed to look at the same general issues, it was determined that the exact topics and the depth of coverage could vary depending upon the biological, industrial, and managerial situation of the particular fishery as well as on the differing amounts of work that had already been done in the various regions. The group met again in December to review and critique each others findings. While each team benefitted from the comments of the entire group, the team members were the final authorities on the contents of their reports.

Each report is meant to be an independent document - prepared by people who are familiar with a particular fishery - especially for individuals interested in its management. The alternative of preparing one large document which considered all four fisheries was judged to be inappropriate. This would have simplified the preparation of the discussion of the general principles, but it would have made the application section rather cumbersome with detailed analyses of problems which do not apply to the same degree in all fisheries. The separation, however, has made it necessary to have some repetition in the four documents. In fact, the teams have exchanged material, and in some cases the exact same text appears in several of the reports.

TABLE 1

ITQ STUDY TEAMS

NORTH PACIFIC GROUNDFISH TRAWL FISHERY

Daniel D. Huppert
University of Washington

Lee G. Anderson
University of Delaware

Russell Harding
North Pacific Fishery Management Council

GULF OF MEXICO SHRIMP FISHERY

Wade L. Griffin
Texas A&M University

Kenneth Roberts
Louisiana State University

Antonio B. Lamberte
Gulf of Mexico Fishery Management Council

John M. Ward
NOAA National Marine Fisheries Service

Holly M. Hendrickson
Texas A&M University

SOUTH ATLANTIC KING AND SPANISH MACKEREL FISHERY

J. Walter Milon
University of Florida

Katharine Wellman
NOAA

John Gauvin
South Atlantic Fishery Management Council

ATLANTIC SCALLOP FISHERY

Jon G. Sutinen
University of Rhode Island

Pamela Mace
Fisheries Consultant

James Kirkley
College of William and Mary

Steven Edwards
NOAA National Marine Fisheries Service

William Depaul
College of William and Mary

It is not necessary to read all four reports to understand the basics of ITQs and how they can be applied to a particular fishery. However, there are enough nuances in the various fisheries and different points of view in the different teams that a careful study of all documents should be worthwhile for those who want to understand all aspects of ITQs. This is especially true for readers interested in designing ITQ programs for fisheries which have common attributes with several of those studied.

The purpose of this overview document is to introduce the four reports by summarizing the main points covered. Section II presents a very brief introduction to the concept of ITQs. A more detailed account in contained in each of the reports and in the Appendix of this document. Section III reviews the basic issues which have to addressed in developing ITQ programs. Where possible and appropriate some of the basic options for confronting the issues are described. Each of these issues and the pros and cons of the options for addressing them are discussed in detail in the four studies, although the depth of coverage on any issue will depend upon its importance to the fishery. The discussion here is meant to lay the groundwork so the reader can better appreciate the material in the studies. This overview document is not enough, in and of itself, to describe how ITQs work. Remember the most important aspect of this effort is to take the existing general information on ITQs, fill in the gaps, and show how it can be applied to specific fisheries. This important task is accomplished in the individual studies. Section IV summarizes some of the problems that are unique to each of the particular fisheries in the hopes that lessons learned in one study can be useful in others. The final section contains the executive summaries of the studies.

II. WHAT ARE ITQs?

While the actual construction and implementation of an ITQ program is a very complex process, the basic idea of an ITQ program is quite simple. The three words - individual, transferable, and quota - which comprise the term ITQ tell the whole story, although it is most useful to describe them in a different order.

QUOTA

An ITQ program is a fisheries management technique that is based on an annual total allowable catch (TAC). Biological concerns for the current size of

the fish stock and for how it will change over time are addressed by limiting the total amount of annual fishing mortality. The procedure for setting the annual TAC in an ITQ program is fundamentally the same as for any other TAC based management regime.

INDIVIDUAL

Instead of an open race for the TAC, however, an ITQ program allocates shares to individual participants. Each participant is given the right to harvest a certain amount of fish each year, usually as a percentage of the TAC. The basic rational for individualized quotas is to insure that the TAC is maintained, and at the same time, to maximize the flexibility and individual control of the participants. Most fisheries management programs allow all interested parties to participate but control total harvest by restricting where, when, and how they operate. The basic premise of ITQs is to regulate the amount each participant can take but to allow them to catch where, when, and how they want. This avoids the race for fish which exists in total quota fisheries and also the complex rules used in fisheries regulated using gear restrictions, or area and seasonal closures. Both the race for fish and the complex rules can have deleterious effects on profit or satisfaction of participants and on product quality. While ITQs have only been used in commercial fisheries, individual shares could also be granted to recreational fishers.

TRANSFERABLE

To increase the flexibility of the participants, the individual quota shares are transferable. Individuals can buy, sell, or lease the right to catch the fish. This allows participants the freedom to operate at a scale which they think is most advantageous. For example, people can buy more rights if they think they can operate more efficiently on a bigger boat or if they can obtain a better price by being able to meet purchase orders throughout the year. Alternatively, people can sell if they choose to run a smaller operation, or they may sell out completely if they choose to retire or go into another business. At the same time, new participants can enter the fishery by buying fishing rights.

If ITQs are granted to recreational participants, transferability between commercial and recreational users would increase the flexibility of both. The problem of the allocation between user groups at any point in time would be determined by their combined actions.

In summary, ITQs are a regulation tool that can simultaneously address the necessary biological aspects of management and avoid some of the problems of traditional management techniques. They can provide operators with the flexibility to increase their profits by lowering their costs (by finding the most efficient way to harvest fish) and by increasing their revenues (by selling their products at those times and in those markets where prices are higher). This flexibility comes from the fact that fishery managers do not have to tell the harvester how to operate. The manager's job can also be easier because he or she does not have to worry about derby openings or about trying to figure out ways of keeping the catching power of a fishing fleet to a level that will not overfish the stock. By facing the allocation decision at the outset, the dual questions of how much to catch and who can catch it are separated. This separation leads to a system which can provide incentives matching the fishing power of the fleet to the productivity of the fish stocks.

This is not to say that ITQs do not have their problems. There are drawbacks, especially in certain types of fisheries. One special issue is that ITQs are a new and fundamentally different way to manage fisheries even though similar concepts are used in other types of resource management. The potential flaws will be discussed below and are covered in detail, where applicable, in the separate studies.

III. THE FUNDAMENTAL ISSUES

A. The Nature of the Property Right

The basic differences between an ITQ program and traditional management tools are the "I" and the "T", the individual ownership and the transferability. Although the basics of the "I" and the "T" have been explained above, their true character is much more complex. The exact nature of the ownership right can have many facets, some quite subtle and others very overt. The nature of the right can be changed or limited to accomplish biological, managerial, or cultural objectives – any of which may be fully within the purview of overall fisheries management. However, one conclusion of all the studies is that it is important to compare what is being gained by meeting these other objectives to what is being lost by the diminished flexibility.

The basic issues concerning the nature of the property right are summarized below. The formate will be to describe the issue and then to present a one or two sentence statement summarizing the various points of view. Finally suggested options to address the issues are provided. In some instances there may be legal considerations that will have to be addressed before using some options.

Eligibility To Own

Should any legal entity be allowed to own ITQ or should ownership be limited to natural persons? On the one hand, preventing corporations from participating may help maintain industry and community structure. At the same time, the limited flexibility may prohibit ITQ owners the opportunity to organize their activities to their best advantage and this may adversely affect the way the Nation's fish stocks are used to accomplish other goals stated in the MFCMA.

Options:

- Allow any legal entity the right to own ITQ shares.
- Allow only persons the right to own ITQ shares.
- Establish other restrictions on eligibility such as banning foreign ownership.

Duration Of Ownership Right

Should the ownership right be permanent, or should it be for some limited period? According to current interpretations of the MFCMA, the ownership right at most can be guaranteed only as long as the management plan which implemented the ITQ program is in effect. By allowing the ownership right to be as permanent as current policy allows, the ITQ owner will have the securest possible planning horizon and will have better incentives to make efficient investments in harvesting and processing equipment and to develop market channels. On the other hand, there may be hesitations to make long term plans if the ITQ share may be given to someone else at a later date.

However, councils may wish to set limits on ownership rights to maintain some long term control over the fishery. By setting a term of X years, a council will have the opportunity to reassign rights if it feels current owners are not using them properly. However, doing so would require that the councils face the very difficult distributional task of reallocating the rights at regular intervals.

Options

- o Ownership rights can be assigned for the duration of the ITQ program.
- o Ownership rights can be assigned for fixed, perhaps renewable, terms.
- o Ownership rights can be temporary initially, but after a trial period, made permanent.

Transferability I

A fundamental issue is whether ITQ rights should be transferable at all. Some would argue that an individual quota makes sense because it allows for better biological management, but that making the rights transferable is not appropriate because it is a permanent and free (given the current Magnuson Act) consignment of a public resource to a private individual. If, however, restrictions on transferability are permitted, they would constrain the flexibility of owners, which as described above is one of the potential advantages of ITQs. Additionally, with no transferability, a council must devise a way to reallocate the ITQs once an owner has died or retired from fishing. Without transferability, the allocation question must be faced over and over again.

Options

- o ITQs can be fully transferable by sale, lease, gift, inheritance or through joint-harvesting arrangements.
- o ITQs can be sold but the rights to catch fish in any one year cannot be leased.
- o ITQs can be made non-transferable. The individual who receives the right is the only one that may harvest the fish.

Transferability II

Even if ITQs are to be transferable, limitations on the types of trades that are permitted may be justified in certain circumstances. The initial allocation will likely include individuals who differ by gear type, boat size, firm size, type of final product, home port, etc. Free transferability between all such individuals may result in changes in the industrial or cultural aspects of the fishery which the council may wish to prevent. Restrictions on transfers between specified groups may help prevent such changes. However, they will also limit the flexibility of ITQ owners and in the long term could become a stifling influence on the development and utilization of the fishery as a whole.

Options

- o Place no restrictions on the transferability of ITQ between different groups of owners.
- o Determine critical groupings of participants and prohibit or restrict purchases, leases, etc. between members of these groups.

Ownership Caps and Restrictions

The Magnuson Act speaks directly to the problem of creating "excessive shares" when implementing ITQ programs. Although there is no clear definition of what an excessive share is, it likely refers to market power for ex-vessel fish, final product, or even ITQ shares. It could also refer to the general historical, industrial, and cultural make-up of the fishery. Councils can take specific actions to address these issues or they may determine that other applicable laws are sufficient for doing so. For example, current anti-trust law addresses problems of excess market power in any industry including fisheries, and the council may conclude that this is adequate. On the other hand, councils may have an interest in directly addressing such issues in the construction of an ITQ program. If this is done, however, the difficulties of defining market power and of measuring the gains and losses of various actions, such that they can be approved as part of a management plan, should not be underestimated.

Options

- o Place caps on the percentage of ITQs for a particular management plan or for a particular stock within a management plan that any one entity can own.
- o Place other restrictions on how firms or individuals can combine to harvest the ITQ. For example, limit the percentage of total catch that can be landed by one boat or landed in one port.

B. Management Units

Defining the management unit or units is an important part of any fisheries regulation program. This is no less true with an ITQ program. A management unit in an ITQ program is the species, stock, or aggregation for which a TAC is specified and for which harvesting rights are distributed. In the Surf Clam and Ocean Quahog ITQ program, there are only two units: Surf Clams throughout their range and Quahogs throughout their range. At the other extreme, the proposed ITQ program for Alaskan Sablefish and Halibut has many management units. Each stock is broken down into several geographic areas.

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Selecting and defining the management units for an ITQ program is a very important step. The success of the program can depend critically on how well it is done. There are two types of questions pertaining to the selection and definition of the management units that must be answered.

The first question is: How many species should be included in the program? If different species are biologically or commercially related, there may be grounds for managing them jointly under the ITQ program. Some of the considerations that need to be addressed are: 1. Are the species caught as a by-catch or a directed catch with the same gear or by the same fleet? 2. Are there ecological or spawning relationships between the species?

Care must be taken when selecting the stocks. There are two types of errors that can be made. An error of exclusion occurs when a species that is closely related to those in the ITQ program is left out. This can make it difficult to appropriately manage the species that are in the program and/or the one that is left out. For example, if the catch of a species which is not covered in an ITQ program has a significant by-catch of a species which is included, it may be quite difficult to account for by-catch mortality.

On the other hand an error of inclusion occurs when a minor or unrelated species is included in the program. Determining and enforcing the TAC for such a species can involve more work and managerial repercussions on the major species than the gains from managing the minor stock are worth.

The second question is: How should each of the included species be classified? There may be several stocks or geographically distinct units of the same species. If so it may be appropriate to have a separate TAC for each. At the other extreme, there may be certain groups which may be treated as aggregations for management purposes even though they are technically made up of separate species. Rockfish in Alaska is a good example. These aggregations can have a joint TAC.

Here again the decisions are critical. An error of conglomeration can occur if biologically distinct stocks are not separated. A single overall TAC on two separate stocks may put too much pressure on one stock if it is closer to port or has a higher catch per unit of effort. On the other hand, an error of specificity may occur if the different species are divided into too many stocks because the program can become unwieldy and difficult to manage.

There is definitely a trade-off in answering these two questions. The larger the number of stocks that are included in the program, the more inclusive the system will be and the lower will be the need for a separate management program to handle species and stocks not included. And, the more finely the quota share stocks are geographically defined, the easier it will be to focus management on more narrowly defined species or species groups if there are biological, technological, or distributional reasons for doing so. However, the larger the number of area divisions, the more complex and difficult it will be to manage the ITQ program. There will be more TACs to set, and the monitoring program will have be able to distinguish landings according to the stock from which they were harvested.

C. The Determination of the Total Allowable Catch

Because the TAC is the main biological component of an ITQ program, it is essential that it is set with care. TACs are used in many other types of fisheries management programs, whether as actual binding limits or as implicit or explicit targets to be achieved using gear restrictions, season closures, etc.. For the most part, the rules and procedures for developing TACs under other programs can apply under ITQ programs as well. The basic idea is to set a total fishing mortality level that is a balance between what can be taken this year and what should remain to grow and/or reproduce for future years. Application of this principle will vary according to the population dynamics and the current status of the stocks under consideration.

There are some facets of TAC determination under an ITQ program that merit special consideration. One very important issue is the definition of the harvest right especially when TACs will likely vary from year to year. The right to harvest cannot be defined in terms of a constant amount of fish each year. In the extreme case this would mean that the TAC, which by definition is the sum of the individual quotas of all participants, could never change. The right to harvest a particular stock must depend upon the current productivity of the stock. Therefore ITQ programs work better if the individual rights are defined in terms of a percentage of the TAC. As the TAC goes up or down according to biological conditions, the individual right to harvest in terms of actual catch will vary accordingly.

Another issue is how to set TACs in those fisheries which have not previously used them. In newly developing fisheries, the accumulated biological data may not be deemed sufficient. In other fisheries, current management may be based on the notion that biological issues can be addressed without using TACs. With scallops, the assumption is that appropriately enforced meat count limits will be sufficient to protect the stock so TACs have not been used. They have not been used with shrimp either because shrimp are essentially an annual crop the size of which can vary depending upon factors other than the number of spawners, and so recruitment overfishing is unlikely.

If ITQs are to be used in these situations, the relevant question is: Are the gains from a reduced race for fish and increased flexibility of participants worth the effort and possible drawbacks of instituting TACs? In developing fisheries, is the best information available sufficient to draw the balance between setting TACs too high and adversely affecting future catches and setting them too low so that current harvests are not unduly restricted? With scallops, can TACs be set that achieve the biological objectives as efficiently as meat counts? With shrimp can a TAC policy be established which can estimate, with in-season adjustments if appropriate, the amount of biomass available for harvest? These issues are addressed in detail in the separate studies and summarized below in Section IV entitled Special Considerations.

Another consideration pertaining to TAC setting is the relationship between TAC determination and the other components of the ITQ program. As discussed above, there are a wide range of issues to be considered in selecting the number and make-up of the management units, and one that deserves special mention is the basis for determining a TAC. Put simply, there needs to be sufficient theory and data to set a credible TAC for a certain species in a specified geographical area. If the problem is a lack of data, it can potentially be overcome. However, if the management unit is defined purely on political grounds, the problem of a credible TAC will remain. In summary, another drawback to expanding the number of management units is the increased data needs and work load of setting one more TAC.

The setting of TACs can also be related to certain enforcement problems. If it is likely that highgrading and by-catch discards will result in fishing mortality that is significantly different than landings, and if there are no other satisfactory ways of correcting for this, adjustments in TACs may be

appropriate. For example, if participants can be expected to discard smaller less valuable fish of a particular species and if the smaller fish normally represent 10% of the catch, the TAC can be reduced by 10% of what it otherwise would have been.

More detail on the determination of TACs is provided both in Section IV below and in the separate studies.

D. Monitoring and Enforcement

A fisheries management program is only as good as its monitoring and enforcement system. This is as true of ITQs as of other types of management. However, there will be some fundamental differences in the formulation and operation of a suitable monitoring and enforcement system for an ITQ program. ITQs are like any other TAC based program in that there must be a way to monitor total harvest and to ensure that it does not surpass the TAC. In addition, however, it is necessary to monitor the harvest of each participant and to ensure that it does not surpass his or her current individual quota level. With transferability, it is also necessary to keep track of the current amount of individual quota owned by each participant. While these extra burdens may seem formidable, it is necessary to evaluate an ITQ management and enforcement system relative to those of other types of management programs and relative to the potential management benefits of an ITQ program. Will overall monitoring and enforcement costs be higher or lower? Even if the costs are higher, are the accomplishments of ITQ management worth it?

The successful operation of an ITQ program requires that the monitoring system be seen as being capable of detecting abuse. Participants must be confident that others can not beat the system and thus diminish the value of their rights. In addition the participants must also know that the system will detect any misconduct on their own part so incentives to cheat will be small. However, this does not necessarily mean that every fish brought to the dock and every landings report filed must be personally inspected by an enforcement officer.

In-person inspections will still be important aspects of an ITQ monitoring system, but its ultimate success will require a computerized system of electronic reporting and data management. In addition, there must be at least two sources of information for any transaction. For example, both the harvester and the

first fish receiver must fill out independent landing forms that can subsequently be double checked against each other. Similarly a transfer of individual quota from one person to another must be verified in writing by both parties. The computer system should have a series of tests that can be run frequently to verify the accuracy and consistency of reported landings and trades.

The work of monitoring agents will change under an ITQ program. The emphasis will shift from checking the day to day operations of the fleet to monitoring catch levels. It is unclear whether the actual amount of monitoring activity or its cost will increase or decrease with an ITQ program. Depending upon the circumstances, it is likely that at-sea monitoring, which can be very expensive, can be significantly reduced. On the other hand the amount of book-keeping type activities will likely be increased. Concurrently, because participants have a long term interest in protecting their harvest rights, they will be more inclined to adhere to the rules and to assist agents in detecting abuse from others.

Permits for both harvesters and processors will likely be a crucial part of an ITQ monitoring system. These permits should be available to any interested party at a nominal fee. A fisherman would be required to obtain a harvesters permit in order to own or lease ITQs. Any harvesting activity would be recorded against the harvesting permit number. Processors would be required to obtain a fish receivers permit in order to buy fish landed under the ITQ program. All purchasing and processing activity would be recorded against the fish receivers permit number. The idea behind a permit program for processors is two-fold. First, it provides for the double entry system that is necessary to establish proper supervision. Second, it provides for a broader based enforcement program. If processors have to show that fish in their possession was legally harvested, they will be very careful from whom they buy. If they will not buy illegal fish, there will less incentive for ITQ owners and non-owners alike to bring in non-quota fish.

Penalties for non-compliance should be firmly established, rigorously enforced and severe enough to encourage compliance. For intentional and rampant cheating, there should be provision to revoke harvesting or fish receiving permits and even to confiscate the basic ITQ harvesting right.

Detailed suggestions of ways to design the monitoring and enforcement programs in specific cases are provided in the four separate studies.

E. OTHER REGULATIONS

The heart of an ITQ program is the TAC. If properly enforced, it will ideally address all conservation issues. However, it is not hard to conceive of instances where conservation issues are not satisfactorily addressed in a basic ITQ program. The following are illustrations.

- A stock may be especially vulnerable to exploitation in a particular location or during a particular season. If this is the case, there may still be incentives for ITQ owners to gear up to make their catches at these times or locations so as to lower their costs. There will still be a race for catch, although it will be limited to fewer participants.

- If the TAC for one species is taken in a particular area, during a particular season, or with a certain type of gear or fishing method, the by-catch or discard mortality of other TAC species may higher than would otherwise be the case.

- Individuals in a particular stock may exhibit high growth rates over a season such that the biomass and value increases if a fish is taken later in the season.

- Fishing in nursery grounds or during spawning periods may have larger effects on future stock sizes than taking equivalent catches at other times or places.

If these or other situations occur, the actions of individuals trying to maximize their profits from their ITQs may result in harvesting patterns which do not optimally utilize the long term productive capacity of the stocks. In short, the TACs will not always address all of the biological concerns, and in such instances, it may be worthwhile to consider supplemental regulations.

The exact additional measures that will be worthwhile to institute, if any, will depend upon the particular circumstances of the fishery. A suggested approach for addressing these problems is:

1. Describe exactly the conservation problem that will not be addressed by a basic ITQ program.

2. List possible ways in which the ITQ program can be modified so as to solve the problem.

3. List possible supplemental regulations that will address the problems.

4. Determine which of the potential solutions derived in Items 2 and 3 best addresses the problem and specify a modified ITQ program which incorporates these additional rules or procedures.

5. Compare the basic ITQ program with the modified ITQ program to determine which one most adequately addresses the management objectives. If the modified one is judged superior it should be adopted; if not, the basic program should be used (assuming that an ITQ program is to be used). The basic issue is to make sure that the modifications do not introduce problems worse than those they solve.

Consider the case where there are nursery grounds or spawning periods where harvests can have significant long term effects. If the quality of the flesh or the product recovery rate falls during spawning, this may not be a problem because ITQ owners may not want to use their ITQs on lower valued fish. However, if costs are reduced by fishing spawning aggregations or if the roe is commercially valuable, there may be incentives to harvest spawning fish rather than at other times of the year which may create a potential problem for optimal utilization of the long term productivity of the stock.

The problem could be addressed within an ITQ program by adjusting the TAC level. Or it may be possible to assign coefficients that would transfer catches at different times of the year into equivalent terms with respect to future stock sizes. For example, each ton of fish harvested during the spawning period could count as 1.5 tons of fish harvested during other periods of the year. This would allow individuals the flexibility to operate when they wanted, but it would force them to consider the long range effect of their decisions. This adjustment would increase management costs. Research would be necessary to calculate the appropriate coefficients, and enforcement would become more complex and perhaps more expensive.

The problem could also be addressed by adding a supplementary regulation that fishing not be allowing in spawning areas or during spawning periods. This would likely be easier to enforce but its inherent lack of flexibility may reduce the potential gains to individual operators that ITQs can provide. It is important to make sure that the gains that are provided in an ITQ program are not taken back by supplemental restrictions unless it can clearly be shown that the overall gains are greater than the costs.

The ultimate questions are which of the two modifications best addresses the problem and if it is adopted, does it provide an overall improvement in the system as a whole? The answer will depend upon the exact biological, economic, and institutional characteristics of the fishery involved.

F. Initial Allocation

The initial allocation of quota shares to individuals is obviously very important. It will, for the most part, determine who gets the gains from an ITQ program. It will determine who will be the initial participants in the fishery. How future participants will be determined depends upon the rules for transferability and the duration of the ownership rights. The importance of this decision notwithstanding, for the most part the initial allocation issue is independent of other components of an ITQ program. It is, after all, a once-and-for-all-step. Given flexible transferability rules and non-expiring ownership rights, allocation decisions only have to be made once. In order to maintain a balanced focus when considering ITQs, the independence of the initial allocation question from the other five fundamental issues (items A-E) should be highlighted. Otherwise, it is possible that the distributional issues will unnecessarily cloud or over-shadow the discussions of other important, but basically independent issues.

There are literally an infinite number of initial allocation options that will be acceptable under the MFCMA and it is not possible to list and discuss all of them here. Similarly there are a large number of ways that the initial allocation can be made in each of the four fisheries and it is also not possible to give a succinct summary of these methods here. One common thread in each study, however, was that they were developed by answering the following questions.

1. Will the rights be sold or given away? If the rights are to be sold, will it be by an auction, by sealed bids, or by some other means, and will existing participants be given a preference?

2. If the rights are to be given away, how will the pool of recipients be selected?

3. Once the pool of recipients has been selected, on what basis will the quota shares be distributed among them?

4. Will the quota shares be based solely on the definition of quota share stocks, or will they be further sub-divided by vessel category, gear type, or some other classification?

Under existing laws, rights can only be given away. Auctions or other means of collecting some of the rents that may be created with ITQs are currently prohibited. However, because certain individuals have expressed interest in

considering the ramifications of changing these aspects of the MFCMA, several of the studies discuss in some detail alternative procedures for initial allocation as well as various aspects of the definition and collection of rent from managed fisheries.

The pool of recipients has typically been chosen on the basis of past participation in the fishery. Historical catch and vessel size or other indicators of investment are the most common basis of distributing quota shares among this pool. For the Halibut and Sablefish ITQ program, the North Pacific Council has divided the individual quotas into vessel share classifications, but this has not normally been the case in other ITQ programs. More detail on general aspects of initial allocation and suggestions for applying them are presented in the four separate studies.

IV. SPECIAL CONSIDERATIONS

In preparing the studies on the four fisheries, each of the issues in the above section were addressed, although the coverage varied in relation to the severity of the problems they posed in the respective fisheries. The purpose of this section is to briefly discuss some of the issues that necessitated special consideration for each fishery.

Alaskan Groundfish

The Alaskan Groundfish Fishery is a very complex fishery. The stocks are related to one another in various ways through the ecosystem and through the actions of the fishing industry. Additionally, the groundfish management program has been developed on top of programs for other stocks which have been managed for much longer periods of time, most notably halibut, salmon, and crab. One of the real challenges of building an ITQ program for this fishery is to coordinate it with these other programs. In many instances, the flexibility of ITQs may alleviate problems, while it others it may make things more confusing.

The stock selection problem is very critical to the Alaska Groundfish fishery, because of the many stocks involved and achieving a balance between potential errors of exclusion and inclusion and of conglomeration and specificity will be a demanding challenge. Enforcement will also be difficult. Keeping track of the individual harvests of so many participants will require a well developed computer assisted system. It will also be necessary to ensure that

highgrading, by-catch, and multi-species harvesting does not lead to over-harvesting of the individual TACs.

Gulf Shrimp

There are two very significant issues to consider in designing an ITQ program for Gulf Shrimp. One is the basis for determining a TAC and the other is how to design an ITQ program which can operate with the large number of participants.

There are two questions relating to TACs in Gulf Shrimp. Why set one? How can one be set? Shrimp is an annual crop, the size of which is not directly related to the harvesting pressure in previous years. A natural question, therefore, is why should there be a limit on harvest in any given year? Limiting harvest in one year will reduce benefits that year but will not likely have a positive effect on catch next year. This is a valid point, but framing the question this way ignores many other important considerations. For instance, although total effort in the Gulf Shrimp fishery has been increasing steadily in the recent past, total catch has not increased proportionately. In fact, for the past few years, total catch has leveled off. There are indications that total effort could be substantially reduced without significantly affecting total annual catch.

Although increased effort has not increased catch, it has increased the difficulties of managing the fishery. For example, inshore closures are harder to enforce the more boats there are. In addition, the incidental harvest of turtles and finfish is likely to be proportional to total effort even if total shrimp harvest is not. Put simply, a reduction in total potential effort could reduce many of the fishery's other management problems.

But the issue is more involved than just inshore closures and by-catch. It is also important to look at the problem of waste from a broader perspective. On the one hand, having a system which may allow some shrimp to die unharvested undoubtedly involves a waste of fish. On the other hand, a system which can harvest the very last shrimp even in peak years will also have waste. When average years come, the fleet cannot be fully utilized and that is a waste of fishing capacity.

An advantage of an ITQ system is that it can address both types of waste. If individuals know that they have a right to a share of the available harvest, they will be motivated to build their harvesting capacity such that they can make the most of the good years, and at the same time not suffer large losses in medium or bad years. There will not be a race to catch fish, so ITQ owners can plan where, when, and how to take his or her share. Concurrently, by-catch problems can potentially be reduced because a smaller amount of effort applied at different times and in different locations will be used to take the allowable catch.

Based on the notion that a TAC program can be justified even with a short lived species, the shrimp team developed a method for specifying a TAC and for making mid-season upward adjustments when appropriate. The method is based on a weighted average of historical catches and full details are presented in the report. Using hind-casting, the TACs determined by this method were very close to the actual amount of catch in previous years.

The method is not perfect and, if adopted, would have to be updated to take into account changes in harvest patterns that would occur as a result of ITQs. Regardless, the study demonstrates that procedures can be found to set and adjust the TAC so that both problems of waste are directly addressed. Given more time, it is likely that a better procedure will be developed.

The large number of participants in the shrimp fishery presents a serious problem for any type of fisheries management including ITQs. The shrimp team suggested that one way to address this problem is to adopt some of the principles of co-management. Co-management is a concept where industry and government work together in developing and implementing fisheries management. Although this is an implied part of the council system, co-management grants more power to, and extracts more obligations from, industry.

It is important to realize that co-management and ITQs are not the same thing. There are many ITQ programs without co-management, and there are many co-management programs that do not involve ITQs. The team felt that using co-management might be a useful way of bringing the industry into the development and operation of an ITQ program and that such participation would help to make the program successful.

Mackerel

Setting up an ITQ program for the commercial sector of the King and Spanish Mackerel fishery would be a moderately difficult task which could be made less arduous by following and appropriately adapting the pattern used in the wreckfish fishery. The really challenging part comes when the recreational sector is included.

An advantage of an all-encompassing ITQ program is that it would be possible to create tradable quota shares for both recreational and commercial fishermen in such a manner that the importance of historical participation and fishing practices of each group is recognized. The users themselves could subsequently determine the most desirable allocation of the stocks. Recreational fishers could buy and sell from each other or from commercial operators. Commercial fishermen would have the same options. The problem, of course, is to set up a system that can address the attributes of recreational fishing that are very different from commercial fishing, the most important of which is many participants land relatively small amounts of fish at a large number of locations.

With two types of users, there are special ramifications for the definition of the nature of the property right. The team concluded that it will likely be necessary to distinguish between the right to harvest for sale and the right to harvest for recreational purposes. Special rules for who can own each kind of right and for how the harvest rights can be convertible from one type to another will also be required. The problem of transferability which must be faced in all ITQ fisheries is made more difficult by the convertibility issue.

Scallops

Technically, the Atlantic Sea Scallop fishery is an ideal candidate for ITQs. Like Surf Clams and Quahogs, scallops do not move and it is relatively easy to estimate the status of the stocks. However, there are still some very important points that must be addressed if a successful ITQ program is to be developed. For one thing, ITQs represent a significant change in the fundamentals of management. There is a large difference between an open-access fishery regulated by meat count and by an ITQ system. The day to day operations of the industry as well as all aspects of management including enforcement and biological research would be changed in some very basic ways.

Some of the other specific problems which will need to be addressed are similar to those faced in the other fisheries. There is the question of how many separate stocks to use as basic management units. It will also be necessary to determine a way to specify the TAC for whatever management units are used. Although TACs are used in other scallop fisheries around the world, they have not been used in this fishery. Methods must be developed which insure the biological safety of the stocks.

There is also the problem of how to handle different product forms. The TAC and the individual quotas will likely be defined in terms of biomass, but the harvest can be landed in the shell or shucked. As a result, it is necessary to find a way to balance catch against individual quota that is fair to those who shuck and those who do not, and at the same time that does not allow the amount of actual fishing mortality to exceed the TAC. Although the fisheries are very different in other ways, the Alaska Groundfish fishery faces this same problem when some of the fish are processed at sea.

V. EXECUTIVE SUMMARIES

ALASKA GROUNDFISH EXECUTIVE SUMMARY

The groundfish fishery in the EEZ off Alaska has the greatest geographic coverage and the largest potential annual landings (over 3 million metric tons) of all the fisheries examined in this study. Before the Magnuson Act, these vast groundfish stocks (aside from the high-priced Pacific halibut) were harvested by foreign fleets from Japan, Russia, and eastern Europe. During the decade of the 1980s, rapid growth in U.S. fishing capacity resulted in, first, replacement of foreign trawling by U.S. catcher boats engaged in Joint Venture fishing; and, second, replacement of most joint venture fishing with a fully domestic fishery. The off-shore sector of the domestic fishery expanded rapidly with the construction and conversion of dozens of at-sea processing vessels (factory trawlers and motherships). Onshore groundfish processing plants are now expanding and making a major contribution to the groundfish trawl fishery. Estimated annual ex-vessel value of groundfish harvests off Alaska fall between $400 and 500 million, while wholesale value of processed products is thought to be near $1 billion.

Management of the trawl fishery by the North Pacific Fishery Management Council has proceeded through three stages. In the first stage, 1977-1981, attention was focussed on regulation of foreign fishing, including gear and area restrictions and annual total allowable catches (TACs) in the Bering Sea and Aleutian Islands region (BSAI) and in the Gulf of Alaska (GOA). Because the U.S. fishery off Alaska was mainly concerned with high-valued king and tanner crab, halibut, salmon, and herring, groundfish management in this first stage was reasonably conservative in setting TACs and it emphasized the avoidance of trawl by-catch. In stage 2 covering 1982-1989, the U.S. domestic fishery grew and the NPFMC increasingly focussed on regulating the by-catch of the domestic trawl fleet. During the second stage, allocation of TACs among competing U.S. fishing sectors (e.g. allocating GOA sablefish to the longline fleet) became a major part of the Council's annual deliberations. In the third and final stage, the major fish stocks are fully exploited by a domestic fleet which shows increasing signs of overcapitalization. The Council's task is to maintain the integrity of biological conservation program, while responding to industry concern that the conservative quotas set for foreign fishing be re-assessed and assuring an equitable access to the fishery for all major sectors of the U.S. industry.

The Council approved an ITQ program for longline sablefish and halibut longline fishing. Whether or not this program is eventually implemented, the Council's deliberation over elements of the ITQ system provides an important backdrop to any consideration of individual quotas in the trawl fishery. Hence, our study of the north Pacific groundfish trawl fishery focussed on issues clearly important to the Council during its debate over longline ITQs. We examined a range of options for all major program design elements, and reached some general conclusions concerning the design of an ITQ system. These are summarized as follows:

(1) All major groundfish species (pollock, Pacific cod, sablefish, yellowfin sole, rock sole, other flatfish, and rockfish groupings) should be converted to ITQ management simultaneously, with separate quotas established for the two major regions (BSAI and GOA). The individual quotas should be issued as quota shares (QS). Because TACs are already set annually for these stocks, conversion of QS to annual individual fishery quotas (IFQs) should be readily feasible.

(2) Two major economic advantages of the ITQ system over the open access competition system stem from (a) the ability of individual QS holders to adopt fishing techniques and choose seasonal fishing patterns to maximize their net earnings, and (b) the freedom to buy and sell QSs, which permits firms to accumulate the most profitable quantities and combinations of quotas. To achieve these economic gains, therefore, a groundfish trawl ITQ system should be uniformly used by all trawl vessels in very broad areas (e.g., just two geographic areas for ITQs -- Gulf of Alaska and Bering Sea). In addition, quota holders need flexibility to find the optimal size and configuration of trawling firms. While some people fear the changes in the industry structure that ITQ transactions could cause, we suggest that few restrictions be placed upon exchanges of QS among trawl gear types, vessel size classes, and modes of operation (e.g., at-sea or onshore).

(3) Multi-species aspects are a major complication. While trawlers are prohibited from retaining by-catch of halibut, king crab, herring, and salmon, mortality due to by-catch depresses the economic value of the directed fisheries for prohibited species, and early closure of trawl fishing due to by-catch quotas retards the value of trawl harvests. Ideally, an ITQ system for trawling will enable groundfish trawlers to adjust fishing patterns to minimize the cost of by-catch. To facilitate this outcome, we recommend that a QS be created for trawl by-catch, and that by-catch ITQs be tradeable among trawl vessel operators. In addition, it is appropriate to further evaluate whether target species QSs should be issued in combinations that reflect actual species mixes in harvests (e.g., cod and sablefish quotas could be issued in bundles).

(4) If product recovery rates vary widely among at-sea processing firms, it becomes difficult to monitor round weight caught by measuring fish product quantities. Use of at-sea observations to establish product recovery rates for individual processors may help to minimize the resulting inaccuracies and inequities.

(5) Because effective enforcement and monitoring of ITQs requires detailed information on landings and quota holdings, new requirements for enforcement of ITQs represent a substantial challenge. ITQ systems in New Zealand and Canada provide ample evidence that individual harvests must be

monitored at multiple stages in the product chain. Catch reports, landings receipts, and fish product unloading and cold storage holdings are essential elements of ITQ monitoring. By monitoring both the paper trail and the "fish trail," consistency among quantities at the various stages can be used to assure compliance with ITQs.

(6) Neither theory nor empirical evidence can provide strong guidance on initial allocation of ITQs. Allocation based upon historic catches can satisfy criteria for equity among established harvesters. Taxes, royalties, and permit fees can be established to provide an equitable return to the public at large for its substantial investment in management of EEZ resources. However, substantial fees or allocation by market mechanisms (e.g., auctions rather than administrative assignments) could be considered only after amendment of the Magnuson Act. Regardless of how the equity issue is resolved, we recognize that repeated consideration of groundfish quota allocations could result in substantial unproductive, but costly, "rent-seeking" activities. Hence, we recommend a once-for-all allocation process, based upon objective and quantifiable criteria.

Several elements of the groundfish trawl ITQ program need further research. These include the legal issues associated with foreign ownership, restrictions on maximum holdings of quota, and enforcement methods. Also, multispecies quota issues (such as product-to-round weight conversion, creating flexibility necessary to permit landing of by-catch, and trading of quotas among gear types) require further consideration. Finally, various formulae and procedures for initial allocations need to be evaluated and presented before an ITQ program can be put forward for serious review.

GULF SHRIMP EXECUTIVE SUMMARY

The Gulf shrimp fishery is not an ideal candidate for an ITQ system. The large geographic area, the large number of fishermen and landing sites, the variability of the stocks, and the short life span of shrimp will make implementation and management of a successful ITQ program difficult, but not impossible. The type of management regime recommended herein is a co-management system in which responsibility for management of the shrimp fishery is shared between government and fishermen. Although co-management is not an integral

component of an ITQ program, it is deemed to provide the most appropriate management environment for a successful ITQ program in the Gulf shrimp fishery.

Fishermen's participation under current fishery management in the U.S. is mainly consultative in nature. Fishery management plans (FMPs) are developed by the regional fishery management councils and approved (or disapproved) by the Secretary of Commerce. Enforcement of FMPs is carried out mainly by the federal government often in cooperation with state fishery and enforcement agencies. Fishermen merely react to regulations that at times radically alter their fishing operations. Although fishermen are represented in councils, current management structure fails to create incentives for fishermen to make the rules work. Co-management, on the other hand, offers a unique arrangement of integration in the management process rule making and enforcement procedures. Co-management by law will grant fishermen's organizations the authority to enforce regulations and impose penalties on their members. This is in sharp contrast to the consultative arrangement that exists in the U.S. with fishery management councils. Co-management allows fishermen's organizations to be directly involved in the decision-making process with government and to have the authority to set and implement their own regulations.

The type of monitoring system recommended is a credit card system with a central computer. Monitoring a TAC and individual quotas for a large and widely distributed fishery can be cumbersome and extremely costly. An electronic data system is the central feature that will enable an ITQ system to work in the Gulf of Mexico. It is essential that instantaneous information processing is in place prior to initiation of an ITQ system.

An electronic system must have the following features:

(1) dockside dealer based--the most centralized place to have recordings take place is with all dockside dealers;

(2) mandatory for all commercial fishermen--all commercial fishermen must go through the dockside dealer even if he wants to sell his shrimp off the back of his boat to tourists;

(3) electronic data system should be operated by a private company--bids could be submitted for setting up this system;

(4) electronic data system should be financed by the fishermen--the fishermen are the primary beneficiaries of an ITQ system; they will have received a private right to a public resource and will reap

windfall gains through the initial allocation of quotas. For example, to pay for the electronic system, shrimpers could be charged a small fee per pound of shrimp landed, which would be collected by dock side dealers and sent to the credit card company on a weekly basis.

With six species of shrimp and six management area (state waters for the five Gulf states plus the federal EEZ), numerous management configurations could be designed for an ITQ system in the Gulf. The recommended management design is a single TAC for all shrimp species and all areas. Such a system recognizes the mobility of the fleet, the mixed species composition of most catches, and would greatly simplify compliance with and enforcement of an ITQ system.

It is recommended that the TAC be set based on a landings forecasting model. Initially a simple model such as a moving average, may be employed. Moving averages of 4,5,6,7, and 8 years were examined for setting the TAC. Using an 8-year moving average, the greatest difference between actual landings and estimated TAC was an 8.6% underestimate of actual landings. Other moving averages which use CPUE or species-specific moving averages also should be investigated. Other landings forecasting models, e.g., time series models, also may have potential.

Permanent rights are recommended because a quota system with permanent ownership rights provides flexibility and is considered superior to term ownership rights, from an economic efficiency standpoint. The more secure and definite the property rights, the greater will be the success of the ITQ program.

There are two aspects to consider in determining who is eligible for an ITQ: who makes the decision on eligibility, and what will be the rules for eligibility. It is recommended that government and fishermens' groups jointly determine who is eligible. Government could establish eligibility criteria jointly with fishermens' groups, and each group could determine who within their group meets the criteria.

One reason for limited success of prior ITQ systems has been constraints on transferability of quotas. Flexibility of quota transfers is of paramount importance. Transferability is linked to one goal of an ITQ program, which is economic efficiency and optimum distribution of effort. Transfer should be for any period of time (lease or sale) and for all or a portion of a quota. This may

seem to complicate record keeping, but with electronic monitoring all transactions could be carried out quickly and easily and would be immediately recorded.

The key features to making an ITQ system work in the Gulf of Mexico are co-management, an electronic monitoring system, and a reliable method of setting the TAC. The biological characteristics of shrimp stock and the complexity of the fishery demands full cooperation among the five state governments, Gulf Council, and NMFS. The biggest obstacle to a successful ITQ system in the Gulf will be coordinating these various government agencies. Aside from differing personalities of various government leaders, statutes and objectives related to fishery management differ among the five states and between the five states and federal agencies. The ITQ system for the Gulf shrimp fishery provides an appropriate setting for the much desired state/federal cooperation in fishery management.

The prevailing belief in fisheries management is that ITQ systems will not work in fisheries with high variation in abundance. But where is the research to support this assertion? Rather than challenge this notion, everyone just accepted it and assumed it must be true. Although wide variations in abundance add another wrinkle to an ITQ system, it doesn't necessarily mean an ITQ system will not work. If an ITQ system is designed properly and is supported by the industry, it can work in a fishery with high fluctuations in abundance. Ironically, of the four fisheries under review for this project, the Gulf shrimp fishery, which has the fewest of the "desirable characteristics" for an ITQ system and appears to have the most strikes against it from the outset, may have the best change of succeeding.

KING AND SPANISH MACKEREL EXECUTIVE SUMMARY

Stock Characteristics and Management Problems

There are at least two migratory groups of King and Spanish Mackerel in U.S. waters: a South Atlantic group and a Gulf of Mexico group. The migratory stocks mix along the southeast Florida coast. The stocks are managed jointly by the South Atlantic and Gulf of Mexico Fishery Management Councils through the Coastal Pelagic Fishery Management Plan (FMP). Each Council is responsible for setting total allowable catch (TAC) in their management area.

The South Atlantic group of Spanish Mackerel has been considered overfished, and management programs to reduce both commercial and recreational catch have been in place for several years. The South Atlantic group of King Mackerel was defined as overfished but was redefined in 1989. Both Gulf of Mexico groups of Mackerel are considered overfished. Since 1985 South Atlantic King Mackerel have been allocated with 62.9% recreational and 37.1% commercial. Spanish Mackerel have been allocated 50%/50% since 1989. Commercial harvests are regulated through the use of quotas and season closures for allowable gear types and recreational harvests are regulated through daily bag limits and season closures.

Management problems cited in the most recent Amendment to the FMP include: lack of reliable biological and economic data to manage and allocate the stocks, continuing conflicts between different user groups and gear types, lack of coordination between federal and state fishery managers, allocation problems caused by season closures and by sales of recreationally caught fish.

ITQ Shares with Multiple User Groups

An advantage of fishery management with ITQs is that it is possible to create tradable quota shares for both recreational and commercial fishermen while recognizing the importance of historical participation and fishing practices. There are many options that could be developed by the South Atlantic Council to address management problems. For example, two classes of ITQ shares could be created: a commercial class with fish sale privileges and a recreation class with possession only privileges. The commercial class of ITQ shares could be further subdivided by gear type or by area. It would also be possible to reserve some percentage of TAC for recreational bag limit fishermen who would not own recreational ITQ shares.

With full trading permitted between ITQ share classes, users could determine the most desirable allocation of the stocks. For example, recreational harvesters could increase their share of total catch by purchasing ITQ shares from commercial harvesters or commercial harvesters could buy recreational ITQ shares. Alternatively, a commercial harvester could increase his share of total catch with a specific gear type by purchasing quota shares from other gear type commercial fishermen. In either case, the transferability feature of ITQ

management makes it possible for the users themselves to determine the desired allocation of TAC based on their willingness to pay for shares of the resource.

As the transferability of ITQ shares is restricted, there would be fewer opportunities for the users themselves to determine the proper allocation and more need for the Council to prescribe the allocation ratio. For example, an ITQ system could be set up for commercial harvesters only with all recreational fishing managed by daily bag limits. With transferability between commercial harvesters, the ITQ shares could be bought and sold so that the harvesters themselves could determine the most desirable allocation to specific gear types. However, without full transferability between commercial and recreational users, the Council would still need to allocate TAC between these user groups.

Initial Allocation Mechanism and Eligibility Requirements

There are many possible alternatives for establishing the initial allocation depending on the number of share classes and the importance of historical participation in the fishery. With full transferability between share classes, allocation decisions only have to be made once. Shares could be sold at auction, awarded through a lottery or given away to current and past participants. For example, ITQ shares could be allocated to commercial fishermen who have held mackerel permits for a certain number of years and can document their mackerel landings during those years. Other commercial fishermen who held permits but cannot document landings could receive a fixed share determined by the Council.

Individual recreational Mackerel landings would be very difficult to document so quota shares could only be given away on an equal basis. This could be done through a lottery. Some recreational users such as charter boats might also receive shares based on their years of participation in the Mackerel fishery. Part of the initial recreation allocation could be assigned to non-ITQ bag limit fishing. Entities such as fishing clubs or state/local government agencies could also receive shares if the Council decided these groups were proper representatives of recreational fishermen.

Operating Permits and Catch Monitoring

Quota share owners could be required to possess an operating permit consistent with the class of ITQ shares owned. For example, commercial fishermen

could be required to have a harvest/sale permit that would allow sales of Mackerel through registered dealers. The permit would be issued in conjunction with coupons comparable to those proposed for the South Atlantic Wreckfish ITQ program. An electronic credit card could also be used to monitor catch.

Recreational ITQ share owners could be required to have a harvest/tag permit. Non-reusable tags could be issued in conjunction with the annual permit purchase and the number of tags issued would be equivalent to the shares owned (converted from pounds to numbers using a conversion factor set by the Council). This permit would allow the fisherman to harvest up to their individual quota during the fishing year. All Mackerel harvested by a holder of this type of permit could be tagged or the Council could decide to require only fish caught in excess of the bag limit to be tagged. To simplify quota enforcement and reduce the incentive to discard fish, it may be desirable to require recreational ITQ share owners to tag all fish in their possession. To aid in monitoring and enforcement of individual quotas, it may also be useful to require that a harvest/tag permit could not be held concurrent with a harvest/sale permit.

The Council could also allow recreational fishermen to harvest Mackerel without share ownership and without a permit if they comply with daily bag limits. Sale of these fish could be prohibited or the Council could allow sales up to the daily limit.

Duration of Ownership Rights and Permits

It would be desirable if ITQ shares could be owned indefinitely until the owner decided to sell or the Council decided to revoke an individual's ownership rights or to terminate the ITQ system. All permits should be renewable annually during the first month of the fishing year to allow close monitoring of participants in the fishery and minimize administrative transactions costs. Permits could be suspended for a specific duration if an ITQ share owner was in violation of Council regulations.

Gear Restrictions

To realize the full efficiency gains that might be possible with ITQ management, it would be desirable to allow any gear approved by the Council to be used to harvest Mackerel under a harvest/sale permit. It is assumed that the Council would not allow certain gears because of undesirable side-effects (e.g.,

by-catch by drift nets) and not because a particular gear is very effective for Mackerel.

Mackerel caught under a harvest/tag permit or the daily bag limit could only be caught by hook and line. This restriction could help to decrease the mortality rate for Mackerel released after catch.

Transferability and Convertibility

Transferability allows owners of ITQ shares to trade harvest quotas through sales or leases. Convertibility is one feature of transferability that allows shares to be converted from one class to another. Ideally, shares and individual quota owned under harvest/sale or harvest/tag permits should be fully transferable during the fishing year. This should include all classes of shares if more than one class is created. Shares and quotas may be sold to existing share owners or new entrants. Both types of purchasers must comply with the conditions of the applicable permit during the fishing year. To help reduce administrative costs of converting shares across classes, it may be desirable to limit conversions from harvest/sale ownership to harvest/tag ownership or vice-versa only at the time of renewal during the first month of the fishing year. Issued coupons or tags could not be converted during the year.

Enforcement

The success of an ITQ system depends on the effectiveness of enforcement in deterring violations. Effective enforcement requires reliable monitoring of catch to detect violations and penalties to sanction violators. The Council can establish a system to provide reliable monitoring by requiring that all sales under the ITQ system must be conducted through registered dealers who would report all purchases from Mackerel share holders. This double entry approach would provide a paper trail to detect violators. Enforcement of recreational ITQs will require monitoring in the field since it would be impractical for recreational fishermen to check-in all landings with a registered agent. The Council can set penalties that are consistent with the severity of the violation. These penalties could include fines, forfeiture of annual permit or quota privileges, or permanent loss of ITQ shares.

Jurisdictional Extent of ITQ System

The fact that the migratory range of both groups of King and Spanish Mackerel leads to mixing in the South Florida area causes some difficult problems. It would not be desirable if the South Atlantic stock was under ITQ management while the other was under open-access management because it would make individual quota monitoring and enforcement more difficult. However, it would be possible to put special restrictions on South Atlantic Mackerel ITQ share owners that would prohibit the harvesting and sale of Mackerel in areas designated outside the South Atlantic region. This would help to eliminate attempts to exceed quota shares by landing and selling catch in the open-access region.

ATLANTIC SCALLOPS EXECUTIVE SUMMARY

In many respects, the Atlantic sea scallops fishery appears to be an ideal candidate for an individual transferable (ITQ) management program. However well the fishery may be suited for ITQ management, it is essential for the success of the program that all of the details of the program be carefully and thoroughly thought through before implementation. Another essential prerequisite of success is industry acceptance of ITQS as a management mechanism.

To contribute to both of these needs, this study lays the foundation for a systematic consideration of the principal elements of an ITQ program for the Atlantic sea scallops fishery, and provides basic information on how ITQs work in general and how they have worked in actual ITQ fisheries.

The central questions addressed in the study include: How would an ITQ program work in the Atlantic sea scallops fishery? If ITQs were adopted for the scallops fishery, what are the major considerations in the design of the program?

To address these questions and achieve the goals of the study, the history and current status of the fishery is documented. This is followed by an overview of ITQ fisheries management and an examination of the available evidence from some 37 existing ITQ programs. Lastly, the salient elements of an ITQ program are described, options for each element identified, and the pros and cons of each option discussed.

History and current status of the fishery

The Atlantic sea scallops fishery is conducted off the coasts of New England (on Georges Bank and in the Gulf of Maine) and the Mid-Atlantic states. In recent years the population stocks of scallops have been at near record-high levels. However, the scallop populations are dominated by small recruits, due to the combined effects of exceptionally high recruitment and high rates of fishing mortality that have reduced the average age and size of individuals in the harvestable stocks.

The fishery is considered to be one of the more important commercial fisheries in the United States; in 1990, the landed value of sea scallops was over $150 million, the sixth largest fishery by value. The fishery has historically exhibited a "boom-bust" pattern in which the resource level and landings are quite high for 4 to 8 years, and subsequently decline to very low levels. Since 1986, landings have increased by 100 percent to more than 40 million pounds of meats. The off-shore fishery currently supports more than 350 large off-shore vessels and 3,000 full-time fishermen at more than twenty ports in ten states. These vessels are divided into two fleets, one working out of New England ports and another out of Mid-Atlantic ports.

The Atlantic sea scallops fishery has a history of self-imposed management measures, including restrictions on catches per trip, crew size, trip length and lay-over days. These measures date back to at least before WWII and were in effect through the 1970s. Since 1982 the fishery has been managed under the Fishery Management Plan for Atlantic sea scallops. The stated objective of the FMP has been to maximize yield per recruit by controlling the average meat count for shucked scallops and the shell height of whole scallops landed. The main problem with the current regime is that it has not prevented fishing effort and mortality from escalating to excessive levels.

Overview of ITQs

ITQs are a means of governing aggregate production by assigning quotas to individual producers. While ITQs are usually associated with fishery management, various forms of ITQs are used in air and water pollution control programs, oil and gas extraction, and throughout the agricultural sector. Other forms of ITQs in fisheries include catch rights, individual fishing rights, individual fishing quotas, and individual vessel quotas, though not all are transferable.

Individual quotas are currently being used in at least 37 fisheries world wide, including one since 1971.

The ITQ approach to fishery management is fundamentally different from the conventional systems of fishery management. The conventional systems of total quotas, time and area closures, gear restrictions, size limits, and license limitation do not convey or establish property rights that are exclusive and transferable. Instead, under conventional measures, the rights to fish are non-exclusive and non-transferable, ownership is either in common with others, or by no one individual or group. It is this fundamental difference in property rights that make ITQs perform differently from conventional management measures.

ITQs are not without their problems. The evidence shows that fisheries managed under ITQs have exhibited problems with high-grading (i.e., keeping only the more valuable fish to count against the quota), underreporting of actual catch, and higher enforcement costs. Those same fisheries have benefitted from increased profits, economic stability in harvesting, processing and marketing, improved product quality, elimination of market gluts, and reduction in post-harvest waste. On the whole, fishermen, processors, dealers, and consumers are reportedly better off under ITQs than alternative management regimes. In the Australian southern bluefin tuna fishery, for example, the net benefits to industry are estimated to be four times the net benefits under the next best alternative management regime.

There are several lessons to be learned from the experiences in other ITQ fisheries. The system performs best when quota shares are denominate in terms of a percentage of the total allowable catch (TAC), rather than in terms of an absolute weight. All systems for monitoring and recording landings should be in place before ITQ are introduced. The onus to accurately report landings must be on the individual fisherman and buyer. Explicit restrictions should be placed on the appeal process for initial allocations. The old components of the management system that work, or that could work well with minor changes and still serve a purpose should be kept. Multispecies problems (if they exist) need serious consideration before implementation of the ITQ system. These and other lessons can greatly ease the burden of implementing a new management program, and can facilitate the realization of benefits from an ITQ management regime.

Elements of an ITQ program for Atlantic sea scallops

An ITQ system for management of the Atlantic sea scallops fishery would include determination of the units of fish stocks to be managed, establishing a mechanism and process for setting the TAC(s), designating the characteristics of individual quota shares, setting requirements for and restrictions on ownership of quota, determining how to initially allocate quota, imposing supplementary regulations, and establishing compatible monitoring and enforcement methods and procedures for the program.

Recommendations for the design of an ITQ program in the Atlantic sea scallops fishery derived in the study include the following:

(1) Denominate the individual quotas as a percent of the TAC and not in absolute weight terms.
(2) Establish a formal mechanism or methodology for setting the TAC that is capable of integrating biological, economic, and social considerations.
(3) Quota shares should be as freely transferable as is administratively feasible.
(4) Rights of quota ownership should be as long term as is feasible under current law.
(5) The ability to transfer quota rights, including leasing as well as selling, should be as free, frequent, and of any magnitude, as is administratively feasible.
(6) The process for appeals of the initial allocation of quota shares should have clear and explicit guidelines setting the terms and conditions of appeals.
(7) The mandatory reporting system for monitoring the program should be computerized and include double entry procedures for verifying landings.
(8) Enforcement of the ITQ program should include auditing procedures as well as the conventional modes currently employed.
(9) Penalties for violations of ITQ regulations should include quota and quota share sanctions, and the loss of quota by offenders.
(10) Voluntary compliance should be promoted and strengthened through educational and public relations programs.

Several issues remain unsolved, however. Among those issues requiring additional research before recommendations can be made are:

(a) Whether to set TACs on one, two, or three separate stock units.
(b) The basis and methodology for setting the TAC(s).
(c) How to accommodate two different product forms in the fishery (shucked and whole scallops).
(d) Determining to what extent consolidation, or concentration, is likely to occur under ITQs, and what measures, if any, should be used to prevent excessive concentration.
(e) The extent to which high-grading may be a problem and what, if anything, can be done to minimize its occurrence.
(f) What supplementary regulations are needed, if any.

(g) What landing requirements to impose on fishing vessels, such as designated port, etc.

There are two issues on which the study makes no recommendations, as they involve political considerations beyond the scope of the analysis. These are determining the method for initially allocating quota, and whether to collect any of the resource rent that will accrue in the fishery as a result of ITQ management. Whatever decisions are taken on these sensitive issues will not likely affect the overall performance of the program.

In conclusion, the Atlantic sea scallops fishery appears to be well suited for an ITQ management program and significant benefits are likely to accrue to industry and the general public were an appropriately designed program implemented.

APPENDIX
An Overview of Individual Transferable Quotas

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An ITQ system of fishery management is fundamentally different from the conventional systems of fishery management. The conventional systems of total quotas, time and area closures, gear restrictions, size limits, and license limitation do not convey or establish property rights that are exclusive and transferable. Instead, under conventional measures, the rights to fish are non-exclusive and non-transferable, ownership is either in common with others, or by no one individual or group. It is this fundamental difference in property rights that make ITQs perform differently from conventional management measures.

WHAT ARE INDIVIDUAL TRANSFERABLE QUOTAS?

Individual transferable quotas (ITQs) are a means of governing the aggregate production by individual producers. While ITQs are usually associated with fishery management, various forms of ITQs are used in air and water pollution control programs[1], oil and gas extraction[2], and through out the agricultural sector[3]. Other forms of ITQs in fisheries include catch rights, individual fishing rights, individual fishing quotas, and individual vessel quotas, though not all are transferable. Individual quotas are currently being used in at least 37 fisheries, including one since 1971 (Table 2).

An ITQ gives an individual fisherman the right to catch a specified quantity of fish, his quota. With ITQs, fishermen's quotas are transferable, in whole or in part. An ITQ is property with certain rights of use, namely, the

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[1] Authorized under the Clean Air Act, the rights to emit air pollutants are traded among plants. For example, electric power plants in the Midwest are allotted allowances of sulfur dioxide they can emit. The utilities can sell their allowances or buy more from other utilities willing to sell. The practice has a ten year history, and was the first effort by the federal government of the United States to use a market mechanism for environmental regulation. Since 1981, the state of Wisconsin has allowed paper mills and sewage treatment plants to trade rights to discharge pollutants into the Fox River as a way to meet water quality standards for the river (Hahn and Hester, 1989).

[2] Well quotas, designated the "maximum efficient rate" by the USGS, are used for oil and gas removal from Outer Continental Shelf lands (Mead, et al., 1985).

[3] Marketing orders are used extensively in agriculture to control the quantity and quality of commodities produced and marketed. Under a typical marketing order, an industry committee decides how much of a crop will be marketed, and each farmer is allocated a maximum amount of the crop he can sell during the period (Rhodes, 1987, p.324ff).

Table 2. Individual Quota Programs

Country	Fishery	Year Adopted
Australia	Western pearl oyster	1982
	Southern bluefin tuna	1984
	Southern abalone	1985
	Southeast trawl	1989
Canada	Atlantic Fisheries:	
	Offshore lobster[a]	1977
	Snow crab	1979
	Offshore groundfish	1982
	Gulf of St. Lawrence fisheries	1984, 89, 91
	Scotia-Fundy inshore fisheries	1991
	Herring	1983
	Offshore scallop[a]	1986
	Northern shrimp[a]	1987
	Offshore surf Clam[a]	1987
	Offshore tuna[a]	1987
	Midshore groundfish[a]	1988
	Pacific Fisheries:	
	Abalone[a]	1979
	Herring[a]	1980
	Black cod	1990
	Geoduck	1989
	Halibut	1991
	Freshwater Fisheries:	
	Lake Winnipeg	1972
	Lake Erie	1984
Iceland	Herring	1976
	Capelin	1981
	Groundfish	1984
	Lobster	1988
	Scallop	1988
	Shrimp	1988
New Zealand	Deepwater fisheries	1983
	Inshore fisheries	1986
U.S.	Wisconsin: Lake Superior lake trout	1971
	San Francisco Bay herring sac roe	1982
	Wisconsin: Yellow perch	1983
	Wisconsin: Chub	1983
	Wisconsin: Menominees	1989
	Wisconsin: Whitefish	1989
	Yaquina Bay, Oregon, herring sac roe	1989
	Mid-Atlantic surf clams and ocean quahogs	1990

[a] Programs known not to allow transfers of quota as of 1991.
Sources: Muse (1991), Crowley and Palsson (1991)

right to catch a given quantity and species of fish in a specific location during a specific period of time. The right is exclusive in the sense that no one else has the right to use the quota without the owner's permission. The property may be assigned, traded, and exchanged; i.e., the owner has the right to transfer ownership (by sale or gift) to others. Other characteristics of the rights of property include their duration, transferability (permanent, seasonal, in-season), flexibility, quality of title, and divisibility.[4] Depending on the property, there are varying degrees of each of these characteristics. For example, an automobile may not be used in a reckless, life threatening manner. The rights of using firearms are limited by laws regulating their use. Even land is subject to expropriation for public use by the state (usually with appropriate compensation) by the right of eminent domain.

ITQ fisheries exhibit property rights that vary greatly in each of these dimensions. In the San Francisco Bay herring sac roe fishery, a fisherman's quota can only be transferred in whole to one of the other licensed fishermen, whereas in the Mid-Atlantic surf clam fishery any part of a quota can be transferred to any U.S. citizen or corporation.[5] In the Australian southern bluefin tuna and abalone fisheries there is no limit on the total quantity of quota that any one owner can possess,[6] while in other fisheries there are limits on the share of the total that any one person can own.[7] In the Atlantic Canadian inshore trawl fishery, permanent transfers of quota were not allowed during the first year of the program.[8]

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[4] For a detailed discussion of these characteristics, see Scott (1988) and Muse and Schelle (1989:99-108).

[5] Muse (1991:2,5).

[6] Muse and Schelle (1989:81), Muse (1991:27).

[7] Wisconsin Lake Michigan chub (Muse and Schelle, 1989:73), Bay of Fundy and Gulf of St. Lawrence herring, New Zealand groundfish (Muse, 1991:8,22).

[8] Muse (1991:12-13); other sources speculate that permanent transfers may be introduced in 1992.

HOW DO ITQs WORK?

A Total Allowable Catch (TAC) is first set for a species, location, and season. Then, each fisherman's ITQ specifies what percent of the TAC he is permitted to catch each season.[9] For the sake of argument, suppose the TAC is set at 15,000 metric tons, and a fisherman holds an ITQ equal to one tenth of one percent of the TAC. The fisherman is then allowed to harvest 15 metric tons (0.001x15,000) during the season.

In the case where the fisherman is satisfied with his allocation of quota (i.e., he wants no more, no less), he can now plan his landings over the entire course of the season. He is not subject to the competitive pressures that exist under conventional management. That is, if he does not go fishing today, the fish he is entitled to will be there tomorrow (subject, of course, to the fish's inclinations). His fish will not be taken by other fishermen as would likely happen under conventional management. Instead, he can plan to catch the fish when they are most available and most valuable. He does not have to race to catch them before other fishermen do.

If the fisherman is not satisfied with his allocation, and would like to increase his quota, he can enter the market and purchase more, much like he does when buying fuel and supplies for his fishing operation. The market for quota, however, would likely function more like the New York Stock Exchange. To purchase more quota, one would contact a broker who would arrange the purchase for a fee. However, private exchanges between individuals would also be possible. If the fisherman would like to sell some or all of his quota, he would enter the market in the same way to sell it for the best price he could get at the time.

What price would he have to pay, or would he get, for quota? A precise answer to this question is not possible. However, two things can be said about it. First, much like stock prices on the New York Stock Exchange, prices will exhibit considerable variability, fluctuating with expected changes in biological

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[9] ITQ programs have used different ways to specify the units of individual quota: in terms of weight of fish, numbers of fish, and shares or units of the total harvest (Muse and Schelle, 1989:99).

and economic conditions.[10] There will very likely be a considerable amount of speculation in the market for quota. For example, if economic and biological conditions in the fishery are expected to improve later in the season, owners of quota will be less willing to sell early in the season, or only willing to sell at prices higher than those justified by the conditions in the fishery early in the season. Second, quota prices reflect expected future profits from fishing. The value of the right to catch X tons of fish is equal to the expected revenue less costs of catching those fish. Therefore, fishermen with more profitable operations will tend to purchase quota from those with less profitable operations. Fishermen who sell will be compensated almost to the extent of the profits they would otherwise earn from using their quota. Fishermen who purchase quota can expect to pay almost what they profit from catching the extra amount of fish allowed by the quota. If the fishery is very heterogeneous, i.e., with a wide range of profitability among fishermen, then less profitable fishermen can expect to sell their quota for more than what they can earn by fishing it. And, the most profitable fishermen can expect to earn much more than what they would have to pay for additional quota.

Quota, of course, need not be bought and sold in order to be transferred. A father may designate the quota to a son, for example. An ITQ is property and may be bequeathed or exchanged in almost any way that other property is exchanged (such as leased temporarily).

HOW ARE TACs SET?

In most ITQ programs, the first step in the TAC-setting process is to conduct an assessment of the current status of the fish stock. Stock assessments are generally conducted by government scientists although universities and private contractors may sometimes be involved. The main outputs of the stock assessment process are estimates of the current size of the stock relative to historic levels, and relative to potential long-term average levels based on standard biological reference points; estimates of current and historic fishing

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[10] In New Zealand a wide range of quota prices exists at any time. Kinship relationships affect the price, as do traders' tax status and desire to increase their share of the market.

mortality rates (the proportion of the stock caught by the fishing fleet) relative to specified target or threshold fishing mortality rates; estimates of trends in the patterns of exploitation with age (the relative vulnerability of each age or size class of the fish to the fishing gear); and forecasts of the likely biological consequences of continuing to fish at current rates and/or reducing or increasing to specified target rates. Catch forecasts vary depending on the rate of fishing, and the size, productivity, age composition and expected pattern of exploitation of the stock.

Typically, the stock assessment agency or group subjects the assessment to peer review by other scientists, but does not set the final TAC. Special boards or committees are often established for that purpose. The TAC-setting authority takes account of the stock assessment (based primarily or exclusively on biological considerations), as well as a range of other considerations such as economic objectives, social constraints, interactions with other commercial or recreational fisheries, and interactions with marine mammal or other protected or endangered species. The adopted TAC level may be close to the biological or economic target or far from it, depending on the relative importance of these and other factors. In general, TACs are likely to be below the long-term expected yield for stocks that require rebuilding, and above the estimated long-term level for relatively new fisheries. But even in a fishery exploited at near-optimal rates, TACs will probably vary in response to fluctuations in recruitment and stock size.

HOW ARE ITQs INITIALLY ALLOCATED?

There are many different ways that ITQs can be initially allocated. In practice most ITQ programs have chosen to initially allocate the quota to boat owners who have a historical record of participation in the fishery. Those who have caught more historically have been awarded a greater share of the TAC.

Initial allocations have been based solely on historical catches in the Australian southeast trawl fishery, New Zealand inshore fisheries, Canadian fisheries in Lakes Erie and Huron, and Wisconsin fisheries for yellow perch in Green Bay and chub in Lake Michigan.[11]

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[11] Muse and Schelle (1989:36,66,72,93), Muse (1991:25), DeWees (1989:132).

Other programs have developed formulas with weights on historical catches, investment, and other factors to determine fishermen's shares. In the British Columbia halibut fishery, for example, the initial quota was based 70 percent on a vessel's historical catch and 30 percent on vessel length.[12]

The use of equal shares has been quite common, having been used in the Southern Australian abalone fishery, the herring roe fisheries in San Francisco Bay, Yaquina Bay, Oregon, and Sitka, Alaska, the Wisconsin lake trout fishery in Lake Superior, and the abalone and geoduck fisheries of British Columbia.[13] In the Bay of Fundy herring fishery qualified fishermen were divided into two groups, essentially based on size. Each large vessel owner was given a quota equal to 2.7 percent of the TAC, and each small vessel owner was given a quota equal to 1.6 percent of the TAC.[14]

The Canadian government allowed fishermen in four Atlantic Coast fisheries to decide among themselves how to allocate TACs. In the offshore groundfish, Nova Scotia trawler, and Gulf of St. Lawrence shrimp trawl fisheries, fisherman elected to base the initial allocation on historical catches. In some areas of the Gulf of St. Lawrence groundfish fishery, vessels were divided into length categories, and each vessel in a category received an equal allocation. In another area of the fishery, fishermen tried to assure that everyone was given an allocation to at least break even.[15]

Almost any initial allocation acceptable to industry will work. That is, the initial allocation does not affect the overall performance of an ITQ program. The principal effect of the initial allocation is determining who gains and by how much. The initial allocation decision can be viewed as a political decision, not an economic or biological decision. Any initial allocation is not expected to affect aggregate production patterns, the market, or the state of the stocks

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[12] Muse (1991:20); a formula with weights on catches and investment was used for initial allocation in the Australian southern bluefin tuna fishery (Muse and Schelle, 1989:79).

[13] Muse (1991:3,5,18,26).

[14] Muse and Schelle (1989:10-11).

[15] Muse and Schelle (1989:16,24-25), Muse (1991:10,14).

in the long run. Transitory adjustments to the long run equilibrium, however, can be expected to be affected by the initial allocation.

Other suggestions for initially allocating the TAC include auctions, much like is done for oil and gas leases, and logging and grazing rights on federal lands. A government auction would collect the resource rent[16] on behalf of the general public. Or, the government could simply hold the quota and lease it out for a fee each fishing season. In this case, the general public would retain the property rights to the fishery and fishermen would simply pay to use those rights. Instead of a government agency, a public corporation could be established to hold the rights and lease them out, conduct the research (or contract it out), set the TACs, and enforce the ITQs and other regulations.

ARE OTHER FISHERY MANAGEMENT REGULATIONS NECESSARY IF ITQs ARE USED?

In some cases supplementary regulations are often desirable even in an ITQ-managed fishery. ITQs do not necessarily eliminate the need to protect the fish during spawning, to prohibit destructive gear, restrict the size of fish caught, and mitigate user conflicts. Therefore, it may serve management goals to supplement ITQs with time and area closures, gear restrictions, and limits on fish size.

In practice, the fisheries under ITQs tend to employ supplementary regulations. In the southern and western Gulf of St. Lawrence there are temporary closures to reduce catches of small groundfish, mitigating the high-grading problem. Mesh size restrictions are used in the Nova Scotia inshore trawl fishery and the Wisconsin chub fishery on Lake Michigan. Limits on horsepower are set in Canada's Atlantic offshore groundfish fishery, and limits on the length of drift nets are used in Wisconsin's lake trout fishery on Lake Superior. In San Francisco Bay fishing for roe herring does not begin until tests show there is at least nine percent roe content in the fish.[17]

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[16] Resource rent is the value of the fishery resource in situ. Under open access the resource rent is dissipated to zero (in the limiting case). Individual quota and ITQ programs can increase the resource rent, creating a significant benefit from the fishery.

[17] Muse and Schelle (1989:20,76), Muse (1991:3,5,10,13).

HOW DOES MONITORING AND ENFORCEMENT WORK UNDER ITQs?

It goes without saying that monitoring and enforcing compliance with individual quotas is one of the most difficult and challenging problems faced in any ITQ program. Most, if not all, ITQ programs mandate records be kept of catches and/or landings by participating fishermen. Records are filed regularly with the quota authority which tracks compliance with the ITQ program.

Some ITQ programs (e.g., New Zealand and the Mid-Atlantic surf clam fisheries) require a parallel set of records be kept by dealers, or primary buyers, who purchase the landed product.[18] The two sets of records should balance for each ITQ holder. This monitoring system is frequently referred to as a paper trail, enabling the enforcement authorities to verify whether the declared landings match the declared purchases by dealers. An ITQ fisherman's declaration is subject to audit in much the same way that the Internal Revenue Service audits taxpayers tax returns.

To guard against circumvention of the required record keeping, some programs employ observers dockside to verify all landings are properly recorded and reported to the authorities.[19] And, to facilitate dockside observation, some programs require designated landing ports and even designated buyers for each ITQ vessel;[20] other programs require vessels to call in at least 24 hours in advance of landings or off-loading so observers or enforcement agents can be present.[21] To further strengthen the control over landed product, tags, coupons, and other ways of marking and tracking the recorded landed product are used in the surf clam, lake trout, and wreckfish fisheries.[22]

Some fisheries under ITQ management require log books be kept by each vessel in the program, recording what was caught and where.[23] Often, such log

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[18] Muse and Schelle (1989:95), Muse (1991:2).

[19] Canadian Atlantic offshore groundfish, and Nova Scotia inshore groundfish (Muse, 1991:11,13,18).

[20] Lake Erie, Lake Winnipeg gillnet, British Columbia geoduck and abalone fisheries (Muse, 1991:16,17,18).

[21] British Columbia halibut (Muse, 1991:20).

[22] Muse and Schelle (1989:60,61), Muse (1991:2), SAFMC (1991:39).

[23] The shrimp trawl fishery in the Gulf of St. Lawrence (Muse, 1991:14).

books are not essential for the ITQ program. Instead, the log books are maintained to monitor the state of the fish stocks for biological assessment purposes. The exception to this are programs where all that is caught, including by-catch, must be recorded and counted against the ITQ. In the Atlantic Canadian trawl fisheries, for example, on-board observers are used to record catch data.[24]

Requiring permits to catch and land fish, and to buy and sell fish is becoming an integral part of most fishery management programs. Suspending or revoking permits has proven to be an effective deterrent to noncompliance in both ITQ and non-ITQ programs.

WHAT ARE THE PROBLEMS AND DISADVANTAGES OF ITQs COMPARED TO OTHER SYSTEMS?

The problems and disadvantages of ITQs include high-grading, underreporting, data degradation, enforcement, class divisions, elimination of small-scale fishermen, reduced employment and income, industry resistance, and inequities. The supporting reasons for each of these are discussed in turn, and the available evidence summarized to indicate the extent of these problems in practice.

High-grading: One of the principal costs and disadvantages of ITQs is that high-grading in the fishery will likely increase. Under ITQs there is an added incentive to keep the most valuable fish to count against quota, and to discard less valuable fish. Serious high-grading problems have been reported in the New Zealand, Wisconsin lake trout, and Ontario walleye ITQ fisheries.[25] It is reported to exist, but not be very serious, in the Gulf of St. Lawrence trawl fishery; and it is reported to not be a problem in the Australian southern blue fin tuna, Wisconsin yellow perch and chub, and San Francisco Bay herring roe fisheries.[26]

In fisheries where high-grading is not a problem, it seems to be due to the lack of a significant price differential between large and small fish, or because

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[24] Observer coverage of the Scotian shelf fleet is 15-20 percent, and the program is paid for by the government. Greg Peacock, DOF, personal communication.

[25] DeWees (1989:135), Muse and Schelle (1989:43,63,95).

[26] Muse and Schelle (1989:69,76,84-85), Muse (1991:5,9).

of mesh size restrictions that result in very few small fish caught. In the San Francisco Bay herring roe fishery, high-grading has been minimized by testing for roe content before fishing by the fleet is allowed to begin.[27]

Underreporting of catch and data degradation: ITQs provide an added incentive to underreport and/or misreport actual catches by individuals in the fishery. A pound of fish not reported is not counted against one's quota, providing the opportunity to catch and earn more than otherwise. As a result, the quality of catch data can be degraded to the point that it seriously compromises the ability to adequately monitor fishing activity. The tendency to high-grade and discard lower valued fish, and to misreport actual catches, reduces the veracity of reported landings.

Underreporting has been a serious problem in the Bay of Fundy herring fishery with, in some years, only about 60 percent of the actual landings being reported.[28] Underreporting is not an intractable problem in the Canadian Atlantic inshore groundfish, Wisconsin lake trout, yellow perch, and chub, and Ontario freshwater fisheries.[29]

Enforcement costs and problems: Some have argued that enforcement costs and problems are greater under ITQs than under most conventional management methods or systems.[30]

The available evidence seems to indicate that the resources devoted to monitoring and enforcement have increased substantially upon introduction of the ITQ program. For example, the costs of monitoring the Scotia-Fundy inshore groundfish fleet increased from about $1.2 million in 1990 to $4.7 million in 1991 when the ITQ system was implemented. Some of the increased costs were start-up costs for the new program, but on-going costs are expected to be around

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[27] Muse (1991:5).

[28] Mace (1985).

[29] Muse and Schelle (1989:29,63,67-69,76), Muse (1991:17).

[30] Muse and Schelle (1989:108-109) observe that the "same types of enforcement concerns exist to some extent with other types of management regimes, however incentives for such behavior may be greater under individual quota programs."

$2.5 million per year, about twice the previous level.[31] Similarly, although New Zealand eliminated most of its dockside monitoring and enforcement program when the ITQ system was implemented, it substituted these relatively low-paid staff with professional accountants and auditors, and initiated a large scale at-sea observer program.

But interpretation of this evidence should be done with care. In cases where the previous management system only attempted to control effort or gear characteristics, an ITQ program usually includes many or most of these controls (e.g., New Zealand), and adds another layer of complexity. In cases where the previous program was based on a fleet-wide quota (e.g., Scotia-Fundy groundfish), an ITQ program will supplant the fleet-wide quota system but the costs of monitoring will almost certainly increase because some of the short-cut methods of monitoring a fleet-wide quota are inappropriate for individual quotas. For example, in some fisheries a fleet-wide quota can be monitored on an aggregate basis by periodically taking inventories of products at processing plants, without the need to assign portions of the products to individual vessels. Similarly, a system that samples a portion of the fleet's activity and prorates landings for the unobserved periods would probably be permissible on an aggregate basis, but not for individual vessels that by chance might be sampled frequently or not at all.

However, in cases where existing management measures are removed and replaced by an ITQ system, enforcement costs may be either less than, or greater than, before. The outcome depends on too many factors to predict the outcome in advance.[32]

One way to reduce enforcement costs under ITQs is to employ enforcement modes that are less costly than conventional at-sea patrols and boardings, and

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[31] G. Peacock, Canadian Department of Fisheries and Oceans, personal communication.

[32] The costs and problems of enforcement are closely related to basic characteristics of the fishery. A fishery (such as the Wisconsin Green Bay yellow perch fishery), consisting of a large number of small-scale operators who fish and land their catches in a large number of scattered locations presents serious enforcement problems -- regardless of the management regime in place. In contrast, a fishery with a few operators who fish and land their catches in a few locations (such as the Mid-Atlantic surf clam fishery) presents far fewer enforcement problems.

dockside investigations. A measure that minimizes the amount of on-site observation and investigation involves establishing a paper trail, mentioned above. Both fishermen and buyers are required to maintain records and file reports to enforcement authorities on the amounts of product landed, sold and bought, and the parties involved. Much like the system used by the Internal Revenue Service, this system enables authorities to verify the landings of each fisherman. This system was first developed in New Zealand, and variants of it are now used in Australia and in the Mid-Atlantic surf clam fishery. While this approach is expected to be more cost-effective than having enforcement officers on the docks to monitor landings and reports of landings, there is no evidence yet to confirm or refute this claim.

There are other ways to reduce the cost of monitoring and enforcement. Requiring designated landing sites or buyers is becoming more popular. This is a way of overcoming the problem of having several possible landing sites to monitor, and reduces the opportunities for fishermen to avoid reporting their landings. This measure is often supplemented with a hailing requirement that fishermen notify the enforcement authorities a specified number of hours in advance of the time and location of their landing and off-loading (as with British Columbia halibut[33]).

Another measure becoming more common, but which adds to costs, is the use of observers to monitor and verify each vessel's landings. In some ITQ fisheries where observers are used, the industry pays for them, and the observers do not have enforcement authority. The fishing industry pays for monitoring and enforcement in the British Columbia geoduck and halibut, and the Gulf of St. Lawrence trawl fisheries.[34] Enforcement is carried out by a private industry association in Ontario's Lake Erie fisheries.[35] In the early years of the Southern Australian pearl oyster fishery, the individual quotas were largely enforced by fishermen themselves.[36] In some cases, the observers are provided by the private sector. This not only reduces the burden on the governmental

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[33] Muse (1991:20), DOF (1991:3,8,12).

[34] Muse (1991:10,18,20), Crowley and Palsson (1991:7).

[35] Muse and Schelle (1989:42).

[36] Muse (1991:27).

enforcement program, it may result in a greater degree of compliance for a given level of expenditure than if the governmental enforcement program carried out the task. Why? First, since fishermen have a greater stake in the outcome of the monitoring and verification activity, they are more likely to comply, and to pressure fellow fishermen to comply with reporting requirements of the ITQ program. And, second, using non-enforcement personnel may be more cost-effective, especially when provided by the private sector. Canada is making extensive use of this measure in the Western Lake Erie, and British Columbia halibut, black cod, and geoduck fisheries.[37]

There is at least one other reason why enforcement expenditures may be more under an ITQ management regime than other management methods. Greater expenditures on enforcement under ITQs may reflect the fact that the benefits from enforcement are more readily perceived by both the management authorities and the industry, especially when the previous management program was not working well. Because of this the enforcement authorities can lobby more forcefully for more resources during budgetary deliberations. In addition, industry may be willing to pay for at least part of the enforcement program. Several examples exist in Canada where industry has agreed to pay for a large part of the enforcement effort, or pay private firms to carry out enforcement duties. The willingness of industry to materially contribute to enforcement efforts undoubtedly reflects fishermen's stake in the fishery derived from the property rights provided under the ITQ system.

Class divisions: There is a concern in some quarters that ITQs create an elite class of fishermen by giving them exclusive rights to exploit the fishery. Those that are not fortunate enough to receive an initial allocation, or be able to buy an allocation, are excluded from the fishery. ITQs thus create groups of haves and have-nots. Under open access regimes, in contrast, any fisherman can freely try his luck at making a living from the fishery.

ITQs undeniably create groups of haves and have-nots. But there is no evidence that ITQs create an elite class of fishermen.

Elimination of small-scale fishermen: Some fear that ITQs would eliminate small-scale fishermen, and be the death knell of smaller, more remote fishing

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[37] Muse and Schelle (1989:42), Muse (1991:18,19,20).

ports. Since quota can be traded like most commodities, it will be purchased by the larger, more profitable fishing operations.

The evidence from existing ITQ programs on this effect is mixed. In the Mid-Atlantic surf clam and the Atlantic Canada offshore groundfish fisheries large companies own the quota because they were initially given the quota.[38] One company in the Surf Clam fishery has consolidated nearly half of all of the quota since the introduction of ITQs.[39] In other fisheries, ITQs have instead helped smaller operators (Australian pearl oyster and Newfoundland cod fisheries).[40] In Iceland, built-in constraints on trading quota protect local and regional fishing interests.[41] What happens in any given fishery depends on a number of economic considerations (including the most efficient scale of operation for the fishery), and program policy.

Reduced employment and crew income: In theory, the incentive to find the most efficient means of production should lead to a reduction in the number of vessels and an associated reduction in the number of crew employed in the fishery (provided it is initially over-capitalized). For the crew remaining in the fishery, their individual incomes may decline as production and earnings are stabilized. The fluctuations in catches and earnings are expected to be mitigated under an ITQ system and, therefore, the economic risk of fishing and the risk bearing premium crew otherwise earn will be reduced.

Once again, the evidence is mixed. In nearly all fisheries with individual quota programs the number of fishing vessels has declined.[42] And for some of these fisheries there are reports of displacement of crew and losses of employment (British Columbia geoduck and black cod, and Lake Erie fisheries).[43] New Zealand fisheries realized a 30 percent increase in both at sea and on shore

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[38] Note, however, that both of these fisheries were dominated originally by a few large, vertically integrated companies before ITQ management was introduced.

[39] Jack Terrill, NMFS, Gloucester, Massachusetts, personal communication.

[40] Muse and Schelle (1989:30), Muse (1991:28).

[41] Muse and Schelle (1989:54,56-57).

[42] The only possible exception is New Zealand, but the data are reportedly unreliable.

[43] Muse (1991:19), Berkes and Pocock (1987:500).

employment with ITQs.[44] Lake Ontario fisheries also saw an increase in employment in processing and marketing as the product shifted from frozen to fresh after introduction of the quota system.[45]

Average crew income increased substantially in Atlantic Canada's shellfish fisheries following the quota system[46]. Trawlermen's incomes have become more stable and uniform in the Atlantic Canada's offshore groundfish fishery.[47] However, in the Lake Erie fisheries, crew shares were reduced, leading to labor unrest and unionization.[48]

Industry resistance: Since ITQs are fundamentally different and unfamiliar to most people in the industry, there is a natural resistance to adopting ITQs as a management tool. Furthermore, ITQs will likely result in displacing the marginal and less profitable fishermen, many of whom receive significant non-monetary benefits from participating in the fishery. Such fishermen, who may be large in number, see their way of life threatened by ITQs, and naturally prefer to remain under open access. Another fear is that the system is irreversible; once it is in place and money has been exchanged for quota, it would be difficult to revert to a more open system of access. While these fears may not be always justified, they are real and are a potent reason for industry's resistance to implementing an ITQ system.

Industry resistance to ITQs is difficult to document. There are anecdotal reports of such resistance in the Gulf shrimp and New England sea scallop fisheries, for example. It is not clear how widespread and deep is the resistance. In at least one fishery, industry was dissatisfied with the

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[44] New Zealand's deepwater fisheries were in a unique situation at the time ITQs were introduced. The offshore resources were under-utilized but required considerable investment to develop (large vessels, specialized equipment and a significant amount of exploratory fishing and experimentation with gear). Without guaranteed property rights, the fishing companies involved in the deepwater fisheries would probably have been unable and unwilling to invest in the development of the fisheries.

[45] Muse and Schelle (1989:45).

[46] From Can. $20,000 to over $40,000 in lobster, and from $22,000 to $37,000 in scallops (Crowley and Palsson, 1991).

[47] Binkley (1989:279).

[48] Berkes and Pocock (1987:500).

particular method of initially allocating quotas (Canadian Lake Erie fisheries).[49] In another example, fishermen resisted allowing quotas to be transferable (Atlantic Canada inshore groundfish fishery).[50]

In other fisheries, such as the Wisconsin Lake Michigan chub and British Columbia geoduck fisheries, industry promoted the adoption of ITQs.[51] In most fisheries that have adopted individual quotas, fishermen and processors are reported to be generally pleased with the program[52]. They are pleased that the fishing season is longer, that product quality and prices have improved, that they are able to time their harvests to take advantage of favorable fishing and market conditions, that they have been able to reduce their fishing effort and operating expenses, and that they now operate more safely than before. They also report satisfaction with the quota shares having value, which has provided some fishermen with better access to credit.[53]

Resistance based on the perceived threat to fishermen's way of life, or to large groups of fishermen, have been overcome in different ways. For example, to protect the way of life in remote fishing communities, Iceland permits the free exchange of ITQs only within each fishing community. Exchanges outside a community must be approved by an industry panel and the Minister of Fisheries.[54] In the Newfoundland cod fishery, individual quotas have actually worked to the advantage of small operators and thereby protected their way of life.[55]

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[49] Muse and Schelle (1989:33-34).

[50] Fraser and Jones (1989:283).

[51] Muse and Schelle (1989:71), Muse (1991:18).

[52] Such reports are from the New Zealand inshore fishery (Dewees, 1989:137), Lake Winnipeg gillnet fisheries (Muse, 1991:16), Wisconsin Green Bay yellow perch fishery (Muse and Schelle, 1989:69,70), British Columbia black cod fishery (Muse, 1991:19), Ontario (Muse and Schelle, 1989:45), Australian abalone (Muse and Schelle, 1989:91), Bay of Fundy herring (Muse, 1991:8), Canadian Atlantic inshore/midshore groundfish (Muse and Schelle, 1989:30, and the British Columbia geoduck fishery (Muse, 1991:18-19).

[53] Dewees (1989:135).

[54] Muse and Schelle (1989:54,56-57).

[55] Muse and Schelle (1989:30).

Inequities: In many fisheries where ITQs are used, the initial allocation is often made to boat owners with a historical record in the fishery. The ITQs are freely assigned with little or no fee being paid. Since the ITQs become valuable, recipients of the ITQs receive a windfall gain, unless the ITQs are auctioned off initially. Other participants in the fishery, such as captains who do not own vessels with a history, and crew who have worked in the fishery, do not so gain. Furthermore, the fishery is a public resource, owned by the general public. Many question the fairness of assigning catch rights to a privileged few, and especially to the owners of capital in the fishery.

WHAT ARE THE BENEFITS AND ADVANTAGES OF ITQs COMPARED TO OTHER SYSTEMS?

The potential benefits and advantages of ITQs include increased profits, economic stability, improved product quality, safer working conditions, less gear conflict, elimination of the race-to-fish phenomenon, less by-catch, less gear loss, improved investment climate, mitigation of market gluts, waste reduction, addition to fishermen's wealth, and compensation for fishermen exiting the fishery. The reasons for each of these expected benefits is discussed, and the available evidence is summarized to indicate the extent of benefits in practice.

Increased profits: Assured of a given quantity of fish, each producer can plan operations to minimize the costs of catching a given quantity of fish. Because he is assured of a given quantity of fish, the producer can plan to catch and land fish when they are in the best condition for market and when the market price is highest.

There is strong, consistent evidence that industry profits increase substantially with ITQs. Increased profits have been documented in the ITQ fisheries of Iceland, Australian southern bluefin tuna, New Zealand, and Wisconsin yellow perch.[56] Prices rise both because of improved product quality and because market gluts are avoided. Average operating costs have generally

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[56] Muse and Schelle (1989:56,69,95), Geen and Nayar (1988:373,378), Dewees (1989:134).

decreased.[57] Inventory costs are reduced because production is smoothed out over the season.

Greater economic stability: Because ITQs provide producers the opportunity to smooth production over the fishing season, to respond to market and stock conditions, and to avoid costly and dangerous fishing conditions, there will be greater stability in the fishery.

The available evidence provides strong support of this benefit. In Atlantic Canada's inshore groundfish fisheries the fishing season more than doubled even though the TAC was reduced under the individual quota program. Stability has been realized in all sectors of Atlantic Canada's offshore groundfish industry -- in harvesting, processing, marketing, and in government's management of the fishery. Companies are able to enter into contracts to regularly supply customers with specified quantities and types of fish at specified prices. Delivery dates can be guaranteed. The fishery is driven by, and can now respond to, market demand.[58]

Improved product quality: Fish will be caught, handled and processed to best suit the market, thus improving the quality of the product available to consumers.

In Atlantic Canada's offshore groundfish fishery, containerization replaced bulk storage on board, resulting in superior product quality. In addition to containerization, fishing practices were modified to improve product quality. Windows have been placed in nets, and tows shortened, to reduce the weight of fish in the net and minimize this source of product damage. Trip lengths have also been shortened to improve product quality. Before individual quotas, processing plants had little or no control over deliveries of raw product. Plants were overloaded and a high proportion of fish were processed into frozen blocks. Heavy losses due to product deterioration were common. At one company the proportion of top quality cod landed increased from 40 to 75 percent with the

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[57] The one exception is Atlantic Canada's offshore groundfish fishery which is dominated by two vertically integrated companies. Since the introduction of the individual quota system, more time at sea is devoted to harvesting the most profitable mix of species for each company. This has led to an increase in operating costs. Gardner (1988:404).

[58] Fraser and Jones (1989:278), Gardner (1988:402).

introduction of individual quotas. The company has realized similar increases in other species.[59]

Superior on-board handling methods were developed in the New Zealand ITQ fisheries to satisfy requirements of the lucrative Japanese market.[60] In the Wisconsin yellow perch fisheries, product form has shifted from frozen to fresh, with a resulting increase in price, and fishermen in Ontario's Lake Erie fisheries now process and market their own fish in order to control quality and realize better prices.[61]

Safety: The incentives to fish during dangerous weather conditions, and with inadequate or unrepaired equipment, will be reduced. Fishermen can forego fishing in unsafe conditions, and wait to fish when it is safe and not give up the opportunity to catch fish.

The evidence on safety effects is limited. In Atlantic Canada's offshore groundfish fishery there has been an increase in the number of on board accidents. The adoption of containerization is more labor intensive and the associated work more dangerous than the bulk storage methods formerly used.[62] However, in two other fisheries safety conditions have improved. In Atlantic Canada's inshore groundfish fishery, the program favors smaller vessels that can operate more safely than larger vessels, and divers in the southern Australian abalone fishery now work at their own pace with less stress and less danger of decompression sickness.[63]

Reduced gear conflicts: In overcapitalized fisheries, the fleet size will likely shrink, and the remaining vessels will spread their fishing effort over a longer period of time. Therefore, the number of vessels on the grounds at any

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[59] Gardner (1988:401-404).

[60] For example, there has been a partial switch in the snapper fisheries from bulk catching methods involving trawls to long-line fisheries where fewer, larger fish are handled with care, iced as soon as possible and air-freighted directly to the Japanese market. Also see Dewees (1989:134).

[61] Muse and Schelle (1989:45,69).

[62] Binkley (1989:282-283).

[63] Muse and Schelle (1989:30,91).

time will decline, thus reducing problems of congestion and conflict on the grounds.

Again, the evidence is limited. In Ontario, the number of conflicts between commercial and recreational fishermen has been reduced. This is due to the reduction in the number of commercial fishermen and the amount of time they spend on the water. They also now tend to avoid the times and places where sport fishing derbies are held.[64]

Elimination of the race-to-fish: Derby, or Olympic, -style fishing would be eliminated.

The evidence provides strong support for this effect. In nearly every case of ITQs being introduced, the competitive furor in the race to catch fish before someone else does is eliminated[65].

By-catch reduction: Since the number of vessels and total effort will be less under ITQs, the by-catch of other species by the ITQ fleet is expected to decline. Furthermore, more care can be taken to reduce by-catch when gear is in the water under ITQs. In the Gulf of Mexico shrimp fishery, for example, by-catch of juvenile finfish would be expected to decline under an ITQ system because fishing would be shifted away from inshore areas to offshore areas where the larger, more valuable shrimp occur and juvenile finfish are less abundant.

There is no evidence indicating whether by-catch has declined in ITQ fisheries compared to other management regimes[66].

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[64] Muse and Schelle (1989:46).

[65] The one exception was Ontario's Lake Erie where, in the first year of the program, fishermen rushed to fill their quotas rather than pacing themselves. This was due to the uncertainty whether a fisherman would lose his unused portion of the quota. Since this concern was removed, fishermen have paced themselves and spread their catches out over the season.

[66] However, by-catch is a significant feature of most fisheries that has to be accounted for in ITQ programs. New Zealand has had serious problems with the illegal discards of by-catch species. Most other ITQ fisheries have manageable or minor by-catch problems. Canada has managed to deal with by-catch by basing individual allocations on historical catches, including by-catch quotas. Fishermen in the programs can also trade-off one species for another at published ratios. Overages of by-catch can also be forfeited to the government at no penalty.

Reduced gear losses: Since the amount of effort will be less, and fishermen will fish during more favorable fishing conditions and with better maintained equipment, fewer losses of gear are anticipated.

There is no available evidence to confirm or refute this contention.

Improved investment climate: The greater economic stability provided by ITQs will reduce the uncertainties and risk from investing in the fishery. Loans for capital improvements should be easier to obtain. Furthermore, investment in fishing power will be designed to minimize the cost of harvesting a given quantity of fish. In some fisheries, for example, we might expect a down-sizing of vessels.

Evidence from a few fisheries (e.g., New Zealand) indicates fishermen are able to use their quota shares as collateral for loans, improving their ability to obtain financing for capital investments. Investments are made to promote more efficient harvesting and processing methods. For example, in Atlantic Canada's offshore groundfish fishery, investments in processing plants have focused on equipment and methods for specializing in the range of products that each plant produces. Before the individual quota system, each plant had to have production lines capable of handling whatever mix of species was landed.[67]

Total capital investment in the industry has declined in most ITQ fisheries, largely due to the reduction in the number of vessels employed. For example, in the Australian southern bluefin tuna fishery, total investment decreased by Aus. $10 million.[68] An exception to this general pattern is the New Zealand deepwater fishery (under utilized at the time) where investment in harvesting and processing increased by 50 percent after ITQs were instituted.[69]

Market gluts are mitigated: Since fishing and landings will be smoothed out over the season, market gluts where large quantities of product are on the market at one time will be avoided. Furthermore, the average quality of the product on the market will be better. Consumers will be better off with fish available over a longer period and of better quality. Fishermen will be better off with the higher average prices that will result.

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[67] Gardner (1988:405).

[68] Geen and Nayar (1988:378).

[69] Clark, Major, and Mollett (1988:343).

The evidence strongly confirms this effect. The season has lengthened and landings have been smoothed out in the British Columbia black cod, Ontario Lake Erie, Manitoba, Atlantic Canada offshore groundfish, Wisconsin yellow perch, and New Zealand fisheries.[70] As mentioned above, the only exception to this was the first year of the individual quota program in Canada's Lake Erie.

Waste reduction: Producers operating under ITQs will have the time to sort, handle, and process fish to maximize its value. As a result, the waste or loss of product that results from the pressures of derby-style fishing will be reduced.

Again, the available evidence shows this effect is real and widespread.[71]

Wealth: An ITQ is a valuable asset. Owning rights to catch fish is similar to owning other property and, as such, will contribute to the individual's wealth position.

There is no direct evidence on the extent to which ITQs contribute to fishermen's wealth position. However, the prices at which quota are traded are high, indicating that the value of a quota share is of a significant magnitude, and not a trivial amount.[72] This indirect evidence suggests ITQs do indeed make a significant contribution to the typical fisherman's wealth position.

Compensation: Fishermen who want to leave, or otherwise reduce their participation in the fishery, may be compensated by the sale or leasing of their quota.

ON BALANCE, ARE WE BETTER OFF WITH ITQs THAN WITH CONVENTIONAL MANAGEMENT SYSTEMS?

For the few ITQ fisheries for which careful analyses have been done, there are significant positive net benefits with ITQs than without. In the Australian southern bluefin tuna, the net benefits to industry (in the form of resource

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[70] Muse and Schelle (1989:20,45,69), Muse (1991:16,19), Binkley (1989:275), Gardner (1988:396,405-406), Crowley and Palsson (1991:17).

[71] See sources cited in previous footnote.

[72] Clark, Major and Mollett (1988:329) cite evidence showing that finfish quota sold for an average price of over $2800 per ton (Australian dollars) in 1986, and abalone quota for over $5800 per ton in 1987. Muse (1991:2) cites anecdotal evidence that surf clam quota was selling for about twice the exvessel price in mid-1991.

rents) are estimated to be in excess of Aus. $6.5 million vs. a quarter of this for the same catch under alternative management schemes. Industry pays nearly 45 percent of the cost of managing the fishery, and for every dollar quota holders invest in management services, they receive a return of about $21 in resource rent.[73]

A cost-benefit analysis of ITQs for the British Columbia halibut fishery estimates the program will generate Can. $7 million per year in increased revenues and cost savings to the industry alone. The annual stream of benefits ia 65 percent greater than that generated by the previous management regime.[74] In the plan document for Alaskan sablefish, the North Pacific Fishery Management Council estimated a clear gain in economic benefits to be expected from managing the fishery under ITQs. Not accounted for in these estimates are the added benefits to consumers of being able to purchase higher quality fish and have fresh fish available for longer periods.

While there have been problems implementing ITQs in some fisheries (such as the Bay of Fundy herring and New Zealand groundfish fisheries[75]), industry spokesmen and fishery administrators give high marks to the ITQ programs in Wisconsin and British Columbia.[76] Despite their problems, a majority of fishermen in one of New Zealand's inshore fisheries reportedly viewed ITQs as better than other forms of management, and a majority reported their condition to be better under ITQs.[77] In the herring roe fishery of Yaquina Bay, Oregon, fishermen are voluntarily using a private ITQ system.[78] In Iceland, where the industry was initially skeptical of ITQs, they soon became supportive of the system and urged the government to implement the system permanently. Many fishermen who have fished under ITQs claim that the system is the best thing to

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[73] Geen and Nayar (1988:378-383).

[74] Fagan (1990:13).

[75] Muse and Schelle (1989:12-13), Clark, Major and Mollett (1988:343-348).

[76] Muse and Schelle (1989:69), Muse (1991:18-19).

[77] DeWees (1989:137).

[78] Muse (1991:5).

have happened in fishery management, and that they and their businesses are clearly better off under ITQs.[79]

WHAT LESSONS ARE TO BE LEARNED FROM THE USE OF ITQs IN OTHER FISHERIES?

Use percentage ITQs. New Zealand's experience provides a strong argument that ITQs should be denominated in terms of a percentage of an annual TAC, rather than an absolute annual catch valid in perpetuity. The designers of New Zealand's ITQ system anticipated that the need for changes in TACs could be accommodated by the government entering the market to buy and sell quota, as required. In practice this was not feasible. New Zealand's fisheries managers underestimated the frequency and magnitude of the changes that would be required. The need for change results from two main causes: (i) accumulation of new knowledge about the productivity of particular fish stocks, and (ii) the dynamic nature of recruitment to fish stocks which causes stocks to exhibit pronounced natural fluctuations in size, sometimes even from one year to the next. In New Zealand, the former cause has been the most common reason for the need for change, but in well-studied fisheries the latter cause is usually more important.

Ensure all essential details of the ITQ program have been carefully thought through. One of the most commendable aspects of New Zealand's ITQ system is that the designers of the system took a "systems approach", incorporating new procedures for handling most components of monitoring and enforcement, as well as procedures for an initial buyback, initial allocation of quota, appeals of quota allocations, and transfers of quota. However, there are a number of factors that were not adequately considered. The most important of these were the implications of the dynamic nature of fish stocks, the lack of basic information on the biology of most stocks, the implications of assessment errors and uncertainties, data needs for stock assessments and fisheries monitoring, and

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[79] Such reports are from the New Zealand inshore fishery (Dewees, 1989:137), Lake Winnipeg gillnet fisheries (Muse, 1991:16), Wisconsin Green Bay yellow perch fishery (Muse and Schelle, 1989:69,70), British Columbia black cod fishery (Muse, 1991:19), Ontario (Muse and Schelle, 1989:45), Australian abalone (Muse and Schelle, 1989:91), Bay of Fundy herring (Muse, 1991:8), Canadian Atlantic inshore/midshore groundfish (Muse and Schelle, 1989:30, and the British Columbia geoduck fishery (Muse, 1991:18-19).

methods for dealing with multispecies problems.[80] Other problems that have arisen that could probably have been anticipated and dealt with before implementing the system include the claims of the native Maori people with regards to fishing rights, and the inevitability that quota for one fish stock will be used up before that of another that is caught in association. Both industry and the management authority should attempt to predict the full consequences of the proposed program for the industry and other user groups, management, and the resources before ITQs are implemented. The major issues of by-catch, limits on quota holding, resource rentals, and other issues need to be addressed.[81]

Give multispecies problems (if they exist) serious consideration before implementation of the ITQ system -- and work closely with fishermen and fisheries biologists to develop feasible solutions (New Zealand ITQ system). When species are caught as part of a mixture, it is impossible to either (i) manage each of them optimally (e.g., manage each to give maximum sustainable harvests), or (ii) set TACs ahead of time in proportion to the ratios at which the various species will be captured. There is no ideal solution but it is probably necessary to decide explicitly which species will be managed "optimally" and how to ensure the persistence of those species that will be managed sub-optimally. The question of whether to include few or many species in the ITQ system is also important.[82]

All systems for monitoring and recording landings should be in place before ITQs are introduced. Also, industry reporting requirements should be simple and concise, and yet meet the needs of management.[83] New Zealand attempted to almost totally replace the old statistical system with an ambitious new one, but

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[80] These problems created a particularly bad environment in which to denominate quota as fixed amounts valid in perpetuity. Luckily, the quota system was able to be changed to a percent ITQ system (whereby each quota holder owns a percentage of an annually-determined total allowable catch), although the fishing industry filed a $NZ150 million court action as a result of the change.

[81] Dewees (1989:138).

[82] Since implementation of its ITQ system, New Zealand has tried a number of different methods for dealing with by-catch and other multispecies problems, all with limited success.

[83] Dewees (1989:138).

even after four years the system was still not up to par. This impeded both the assessment and monitoring of the fisheries.

The onus to accurately report landings must be on the individual fisherman and buyers. In the early years of the Bay of Fundy herring IQ program, quota violations were defined as occurring only when the annual individual quota was exceeded, not just when a single landing appeared to be in error. Processors and fisherman collaborated to withhold and/or misrepresent information to the maximum extent possible. Therefore, it was difficult to obtain and verify all of the purchase slips (the method used to monitor landings) in a timely fashion. In addition, there was an unwritten policy that quota overruns from one year would usually be forgiven at the start of the next. These problems, combined with an overburdened court system meant that violations were rarely detected or, if detected, were often not prosecuted. Provision of landings data within a reasonable time frame should be mandatory. The excuse that "nobody came to collect the data" should be unacceptable.

Don't proceed too slowly with the implementation of a new ITQ program. As has been demonstrated in the Mid-Atlantic surf clam fishery, the more time fishermen have to anticipate an ITQ program, the more difficult the initial allocation problem becomes.

Involve user groups in the process of determining how the quota will be initially allocated.[84] The initial allocation decision can and should be kept separate from how the ITQ program is to work. The main consideration in the initial allocation decision should be that the users of the resources accept the method, since the performance of an ITQ system will be unaffected by almost any method of initial allocation. Therefore, once the general criteria for eligibility are set, the task of initially allocating quota can be assigned to users (industry, etc.).

Put explicit restrictions on the appeal process for initial allocations. In New Zealand, of 1800 initial allocations, there were 1400 appeals. The Quota Appeal Authority is still considering cases five years after implementation of the program. To date, they have generally awarded additional quota to the complainants, such that the sum of ITQs is now far in excess of the highest

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[84] The Canadian government has gone so far as to allow fishermen to decide among themselves how to allocate quota (see discussion on initial allocation above).

recorded annual landings for many stocks. The criteria for agreeing to hear an appeal, and the criteria for deciding in favor of requests for additional quota, need to be rigidly defined.

Quota trading and leasing should be made clear, simple, timely, and readily accessible. Also, the system should be completely ready for operation as soon as the ITQ program is implemented. This is necessary to facilitate the efficient management of quota holdings and landings.[85]

Adequate resources need to be committed to effectively implement and manage the ITQ program. The start-up costs of an ITQ program can be quite large. Resources are needed for the development, implementation, and operation of the monitoring and reporting systems, enforcement operations, educational and communication efforts, biological and economic research for setting TACs, and monitoring the effects management has on the state of the stocks and economic performance.[86]

Don't get rid of old components of the management system that work, or that could work well with minor changes. The New Zealand government had previously put considerable resources into devising a meaningful set of statistical areas for reporting catches and designing logbooks that represented the best compromise between maximizing the amount of information requested and maximizing the likelihood that it would be filled in completely and accurately. Logbook data were not readily accessible because there were too few resources devoted to maintaining the program once it had been implemented: there was a backlog of data to be key-punched and there were no computer programmers to develop software to extract the data. However, these problems could have been overcome. Instead the entire system was scrapped and new statistical areas, logbooks and reporting requirements were developed. The main consequence of these actions was to further reduce a database that was already inadequate for stock assessment purposes. The previous statistical areas did not map into the new ones, measures of effort often could not be converted, and time series of catch per unit effort statistics (often a major ingredient of stock assessments) had to be restarted.

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[85] Dewees (1989:138).

[86] Dewees (1989:138).

Subsequently, it has been found that the new logbooks are unsuitable for other objectives as well.

Beware of schemes to enable fishermen to increase their individual shares, such that the sum of individual shares will almost certainly total more than 100% of the TAC. In the early years of Iceland's ITQ system, fishermen were allowed to choose between an ITQ and an "effort quota", the latter being calculated as the number of days required to produce the average harvest for each particular category of operation. It is probably predictable (at least in hindsight) that fishermen would choose the option that was likely to give them the largest harvest and, therefore, fishermen who opted for effort quotas would tend to increase their share of the TAC at the expense of fishermen who chose ITQs, and overall TACs would probably be overfished. A similar example from New Zealand's ITQ system relates to the initial definition of ITQ in terms of absolute amounts of quota. Fishermen were allowed to choose their best two out of three years, thus leading to the possibility that the sum of ITQs would exceed the highest landings recorded over the three years.

Recognize the diversity of skills and motivation of fishermen. Plans that treat all fishermen as "average" (or average for their category) may not be acceptable to the "highliners", a relatively small group of fishermen who often account for a large percentage of the landings. When the individual vessel allocation program was instituted in Nova Scotia, a fishermen's cooperative was established to help administer the program. One of the initial functions of the cooperative was to decide the basis for allocating the TAC among its members. The members agreed to divide the quota in the following way: one-third distributed equally, one-third based on vessel size, and one-third based on historical participation. The problem was that this system had the greatest benefits for the relatively poor fishermen and penalized the highliners. Eventually the functioning of the cooperative was undermined, partly because highliners decided they could do better for themselves by working directly with processing companies (and colluding with them to misreport landings).[87]

Don't try to collect all of the resource rent. In his recent review of New Zealand's attempt to collect resource rent in its ITQ program, Pearce (1991:14) argues that it is impractical to try to capture the resource rent with an annual

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[87] Mace (1985), White and Mace (1988).

fee: "The concept of economic rent is so elusive, hard to quantify, and so volatile in the face of changing markets and resource conditions that it does not provide a feasible basis for assessments." Also, if the goal is to collect the resource rent, the mechanism for collecting the rent should be implemented at the beginning of the program. The resource rent accrues to the initial holders of quota, unless taken away by the government at the outset.

Beware of rent seekers. When individuals stand to gain from changes in management policy, they naturally attempt to lobby and petition managers for changes that would benefit them. Fishermen may sacrifice valuable time fishing to attend meetings of the management authority, and industry associations may engage the services of lawyers and lobbyists to help the association influence decisions on TAC setting and the allocation of quota. This inherent tendency for individuals to increase their share of resource rent and other benefits is termed "rent seeking." Rent seeking imposes significant costs, on rent seekers themselves, on the management authority (as its resources forego working on other matters to tend to rent seekers demands), and on the entire fishery (if the taking and implementation of decisions is slowed by rent seekers). These costs subtract from the potential gains from the resource and from the net value of the nation's production of goods and services. In theory, these costs can be so large as to completely offset the gains from resource management.[88] Hide and Ackroyd (1990) describe how rent seeking by different groups of fishermen and politicians is dissipating the gains made in some of New Zealand's ITQ fisheries. Rent seeking cannot be stopped altogether, nor should it be. However, it can be controlled by operational policies and practices that establish firm guidelines to govern the nature and extent of such activity.

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[88] Anderson and Hill (1991).

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Testimony of the Surf Clam Ocean Quahog Ad Hoc Committee
to the
Subcommittee on Fisheries Management
of the
Merchant Marine and Fishery Committee
of the
United States
House of Representatives

Presented by
David H. Wallace, Jr.

SURF CLAM OCEAN QUAHOG AD HOC COMMITTEE

The Ad Hoc Committee is made up of most of the major surf clam and ocean quahog processors and fleet operators. Some of the processor members also own vessels and/or clam allocation. All of the vessel operators own allocation. The Ad Hoc Committee Members are:

Atlantic Shellfish, Inc.	Cape May, New Jersey
B J Clam Company	Powellville, Maryland
Blount Seafood, Corp.	Warren, Rhode Island
Cape May Canners, Inc.	Cape May, New Jersey
Chowder, Inc.	Dennisville, New Jersey
Gorton's of Gloucester	Millville, New Jersey
Martin Fish Company	Ocean City, Maryland
Mid-Atlantic Foods, Inc.	Pocomoke City, Maryland
J. H. Miles Company, Inc.	Norfolk, Virginia
Sea Watch International, Ltd.	Easton, Maryland
Shellfish Vessels, Inc.	Manahawkin, New Jersey
Surf Side Products, Inc.	Port Norris, New Jersey

History of the Surf Clam Ocean Quahog Industry and the ITQ System

The surf clam and ocean quahog industry has known that management of the resource was essential as far back as 1972 when the industry through the State/Federal Program began meeting to look for ways to keep from over-fishing the surf clam population. The Magnuson Act gave the clam industry the vehicle to implement the regulations necessary to protect the clam stocks from the industry's propensity to over-fish. In 1977, the first federal fisheries management plan under the Magnuson Act was the Surf Clam and Ocean Quahog Fishery Management Plan. The FMP included stringent quotas (based on the best scientific information available and maximum sustainable yield), fishery closure when the quota was caught, a moratorium on new vessels entering the fishery, closed areas, restrictive fishing times, and later, a size limit. The industry had over-fished the clam resource in the past, and understood that fishing effort had to be restrained. The participants knew that it was, and still is, absolutely vital for survival and stability of the fishery to have effective regulations in place.

The Surf Clam and Ocean Quahog Fishery Management Plan's Amendment 8 went into effect over three years ago. The basic management system was changed by Amendment 8, from a time based allocation system to an Individual Transferable Quota system. A number of clam fishery participants brought suit against the Department of Commerce in an attempt to stop implementation of Amendment 8. The management plan was adopted, and the law suit failed. The industry then set about adjusting to Amendment 8's ITQ system.

With the changes in the management system, the Northwest Atlantic clam fishery changed very rapidly. The first to change were the fleet operators who's surplus fishing capacity was reduced overnight. Later, the independent one-boat and small fleet owners sold out or leased their allocation, this further increased vessel consolidation to a total reduction of nearly fifty percent in the first three months after the plan went into effect. The industry went from a grossly over-capitalized fishery that operated at highly inefficient

levels, to one that was well balanced and appropriately capitalized, in a very short period of time. This was accomplished without any cost to the government, while helping control and support the quota well within optimum yield. After three years, the industry has consolidated to the point that the remaining vessels are fully employed.

Advantages of the ITQ System

ITQs have changed the way the clam industry does business. Because of consolidation, the fishing fleet has no surplus capacity, and all vessels are fully employed. Since the industry does not have excess fishing capacity, vessel owners have no incentive to push for higher quotas. Most vessel owners also own allocation In general, they are very concerned with conserving the resource. In the late 1970's and early 1980's, everyone in the industry suffered under very low quotas while the surf clam stocks recovered. Today, there is no support inside the clam industry to over-fish the resource. The objective is for stability, now and for the future.

Under the former time based allocation system, the clam industry did not have flexibility. The regulations governed in detail how the fishery operated. As the industry and resource changed, the regulations had to be adjusted. This explains why there were so many amendments to the FMP. The clam ITQ system was to have been flexible enough to allow industry to make any adjustments without involving the government. Thus, additional amendments to the plan would not be necessary.

The allocation owner's freedom to transfer allocation to another allocation holder or vessel is the chief advantage of the clam ITQ system. Today, more than two thirds of all clams caught are taken by vessels that have no financial connection with the allocation owner. They simply catch the allocation for a fee. This allowed some of the smaller, independent vessel owners to stay in the industry after implementation of Amendment 8 implementation.

How the system is threatened. NOAA General Counsel advised the clam industry on Thursday, February 3, 1994, that they had administratively imposed allocation sanctions in the penalty schedule of the Surf Clam and Ocean Quahog Management Plan. **The industry today is in shock**. When NOAA proposed these allocation sanctions over a year ago, the industry banded together and formed the Ad Hoc Committee. On numerous occasions, we pointed out to NOAA General Counsel how allocation sanctions would undermine the very foundation of the ITQ system. Sanctions will force allocation owners to also become vessel owner/operators. Large corporations will be the only entities able to lease or rent allocation. This is because of their ability to guarantee allocation or cash replacement in the event of an allocation sanction. Today, allocation can be revoked. Allocation is not treated as a property right, there is no way to protect the allocation by law. NOAA has administratively changed the entire surf clam and ocean quahog management system without the public hearing process and an amendment to the FMP. They will likely bankrupt many small vessel operators as well as negatively impact the whole clam fishery. **THIS IS OUTRAGEOUS AND UNCONSCIONABLE BEHAVIOR FROM THE FEDERAL GOVERNMENT.** The clam industry has never opposed rational enforcement. Nor have we opposed stringent financial penalties, we support them. The problem with this regulation, is that today most allocations are caught by contract fishermen. In most cases, the contractor would be the violator and the allocation owner would be the one to be penalized. It is likely that the allocation owner, totally uninvolved in the violation, would be penalized millions of dollars because of a vessel operator, who they have no control over. The typical clam industry allocation trade is from the allocation owner to a processor, to an independent vessel owner. The allocation owner, in many cases, has no idea which clam fishing vessel is going to catch his allocation. Allocation sanctions are unnecessary and destructive. Today, the NMFS has the right to fine a vessel owner one hundred thousand dollars per violation. The vessel's captain can be fined a like amount. In almost all cases, the vessel is charged with multi-violations and fines can amount to many hundreds of thousand of dollars. If a vessel operator persists in violating the regulations, the vessel can be seized. The clam industry feels that the NMFS has all of the tools necessary to penalize violators. Implementation of this new penalty schedule will force allocation owners to own and operate clam vessels. It goes without saying, that independent fleet owners do not want allocation owners to own

and operate clam vessels. If the allocation owners purchase vessels, independent fleet owners will be forced out of business.

Under the Magnuson Act, Individual Transferable Quota is not a property right. Therefore, financial institutions are very reluctant to lend money to purchase clam allocation. Since allocation is not a property right, financial institutions cannot by law, place a lean on the allocation. Banks have become very concerned about the stability of the ITQ system and consequently their loans. Some banks were willing to finance relatively small purchases of allocation to small companies, by putting the allocation in the bank's name until the loan is repaid. However, with allocation sanctions a reality no bank will be willing to lend money for allocation purchase. They will have no protection, even when allocation is held in their name it can still can be taken away. Allocation sanctions put small privately held companies out of the allocation purchasing market. They have no where to borrow funds for allocation purchase. Only large public corporations will be able to raise the money to acquire allocation. Even the large publicly held corporations do not favor allocation sanctions because most of them contract out the catching of the allocation to independent vessels. The changes in the penalty schedule will force allocation owners to purchase vessels to catch their own allocation in order to avoid the risk. Allocation sanctions serve no one well.

The Clam Industry's ITQ system did away with a massive number of regulations which prevailed under the old management system. This has saved the government time, money and reduced personnel. There are a number of ways the ITQ system could have been even more streamlined, however, it is a vast improvement over the previous system. Being the first ITQ system under the Magnuson Act as well as an experiment, the Amendment has far more regulations and controls than are necessary. The paper work and control systems **demanded** by NMFS enforcement make up the bulk of the unnecessary regulations. The industry supports strong enforcement and control but not to the extremes of Amendment 8. Many of the regulations have no real enforcement value, and are extremely burdensome and costly to industry and NMFS. A classic example is the call-in prevision. It requires each and every federally permitted clam vessel to call-in to NMFS enforcement before leaving the dock on a clam catching trip and then provide enforcement with a large quantity of information. This is completely unnecessary for most of the vessels. Industry proposed rules which addressed enforcement's concerns, but they were rejected by NMFS's enforcement division. NMFS's enforcement was determined to have all clam vessels call-in. Even ocean quahog vessels, which have never had a single at sea violation in the history of the FMP. From 1977 to today, more than 60,000 vessel trips have been completed without even an enforcement warning, yet the industry is being punished. The only violation a quahog vessel can receive is for failure to call-in or not provide the required information. These types of regulations go too far. The details of the call-in were implemented administratively after Amendment 8 was in effect.

Disadvantages of the Clam Industry ITQ System

Unhappily, the Surf Clam and Ocean Quahog ITQ system is not a perfect system. The biggest fear of industry is that in some way the ITQ system will be slowly dismantled and changed. Years ago, clam fishery participants took very large reductions in catch, at very high financial cost. This was to allow the resource to recover. The industry has invested heavily in eliminating overcapitalization. Because of our forbearance, today the clam industry is a stable fishery, unlike many other east coast fisheries. Many fisheries have had uncontrolled fishing for years, which continued until their stocks collapsed. Now they look enviously at the clam industry, which has a stable population. If there were more boats, the fishery could produce more clams. Just do away with Amendment 8 and the quota. Then, boats from the collapsed fisheries could catch clams and destroy the clam resource, as they did their own.

When Amendment 8 went into effect, it was assumed that control of the fishery would be returned to the industry. We have come to realize that the National Marine Fishery Service has had a great difficulty giving up the control they enjoyed under the old management system. The clam industry had thought that the ITQ system was going to eliminate government from their day-to-day operations. It was also understood that when the ITQ system went into effect, there would be no fundamental changes in the new

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management system. Unfortunately, this is not the case. Today, Amendment 9 has already been to public hearing. This Amendment if adopted in it present form, will gravely undermine the clam ITQ system. It allows the Maine quahog fishermen to fish in the federal zone without allocation or any other federal controls. Maine had always led the federal government and the clam industry to believe that these clams were being taken from state waters, that was not the case. Just before the clam ITQ system went to effect, the Coast Guard caught Maine quahog vessels in the federal zone without fishing permits. According to the State of Maine they moved offshore because the fleet had caught all of the quahogs in state waters. Amendment 9, today is a secretarial amendment which the Mid-Atlantic Council has requested to be put on hold while they try to solve the problem. The amendment as written turns over all controls of the quahog fishery in the federal zone to the state. The ITQ clam industry treed to solve this conflict by offering a compromise, the State of Maine turned it down, preferring no federal regulations or controls, for their fishermen, in a fishery that they have no rights to. This undermines the whole concept of federal fishery management plans and the Surf Clam and Ocean Quahog FMP's ITQ system in particular.

On a number of occasions, motions have been passed by the New England Fisheries Management Council, asking that management of the New England surf clam and ocean quahog fishery be transferred to them, and taken out of the Management Plan. These requests will continue to be made. In the event the Subcommittee determines that ITQs are a viable management tool., the clam industry would respectfully suggest that in the re-authorization of the Magnuson Act, it be made clear that if an ITQ or a similar management system is implemented, it is the intent of Congress not to change the plan or allow them to be undermined by political pressure from outside of the industry. Clearly, at present, this is the case in the clam industry.

Conclusion

We in the clam industry, generally feel that ITQs are a good, effective management tool, despite some problems which are inherent under the Surf Clam and Ocean Quahog FMP as it is presently structured. Any new fishery ITQ system would suffer these same problems. Fortunately, you, the Congress, have the opportunity to play a pivotal roll in solving some of these problems. But first, you must recognize and believe that ITQ's have real management value. If so, fix the Magnuson Act so the cannot be undermined.

Some fishermen outside of the clam ITQ fishery believe they are entitled to a share of the resource. Most feel entitled because the species they traditionally fished have been over-harvested, consequently they can no longer make a living. We all have sympathy for fishermen in that situation. However, if the industry that manages and nurtures its fishery is not protected from the those outside who do not, then ITQs should never be used as a management tool, and are useless to the fishermen who protect their resource. Those who are attacking the clam industry's ITQ system are not taking it head on but attempting to pick away at its foundation. They have all kinds of reasons which on the surface appear to be reasonable and rational. This is seldom the case. These fishermen want to change the rules to allow themselves access to a resource which they have no rights to. In many cases their traditional fishery was destroyed by the lack of effective resource conservation and management. These fishermen do not want any regulations or controls.

A much larger problem is convincing NMFS that when an ITQ system is carefully structured, they can cease managing the fishery on a day-to-day basis. The more simple the ITQ system, the better it will work for the industry and government. From the clam industry's point of view, it appears hard for the government to stay out of our daily business. The allocation sanctions and the call-in are examples of how the government changes the system after the fact, and without amendments to the FMP. When an ITQ plan goes into effect, the regulated industry adjusts to the new rules. If the rules keep changing, the industry gets out of balance and cannot operate smoothly. In the case of allocation sanctions, these unreasonable penalties will completely change the industry in a negative way as well as put many independent vessel owners out of business. Allocation sanctions were not part of Amendment 8, if they had been, most of the industry members who supported the amendment would have opposed it. **NMFS cannot keep changing the rules administratively without considering the effect on the fishery.**

Today, the members of the Ad Hoc Committee generally feel that the National Marine Fisheries Service has done the industry a grave injustice in changing the rules, from the way they were intended in Amendment 8. The Individual Transferable Quota fishery management system was not designed to be changed after it was implemented. The Surf Clam and Ocean Quahog FMP is an ITQ experiment. We feel that the National Marine Fisheries Service has undermined the ITQ system and our industry. We suggest that no new fishery adopt an ITQ based management plan while NMFS is so determined to change regulations at will. In theory, ITQs are a good management tool, but as a result of our experiences, we feel that no fishery should put themselves at such risk.

Thank You,

The Surf Clam and Ocean Quahog Industry
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Answers to questions submitted to Wallace and Associates, representing the surf clam/ocean quahog industry Ad Hoc Committee by the Subcommittee on Fisheries and the Honorable William J. Hughes, dated February 24, 1994, as a follow up of testimony on February 9, 1994.

Questions from the Subcommittee on Fisheries

How should the quota be allocated?

In the Surf Clam/Ocean Quahog FMP there are a number of different formulas. They are all based on historical catch. The clam industry believes that the vessel which historically catches the fish should be allocated the quota under an ITQ system. Historical participation should be measured over a long period of time.

Does the ITQ allocation amount to a federal give-away?

Because of new technology in vessels, gear, electronics, and too many fishermen, it is possible that the entire fish resource could be caught. An ITQ system managed properly would reduce the number of fishermen and gear to the level of sustaining the fish stocks. The fishermen who leave are bought out, not forced into bankruptcy. Overcapitalization of the fishery is eliminated by the remanding fishermen. Fishermen in a fishery that is operating under strict quotas before an ITQ system goes into effect, pay a high price, in that they have lower incomes at higher costs. After ITQ's go into effect, the remaining fishermen must supply the funds to finance the buy-out of those fishermen who wish to leave the industry. This brings industry overcapitalization under control, and it is accomplished without government involvement or investment.

Should ITQ's be auctioned off?

If ITQs were to be auctioned off, the fishermen who cannot afford to purchase allocation would be driven out of business without any compensation, instead of being able to sell their shares. The auction approach would require the money collected to be used to support the operators who are forced out of business. Further, the concept would be unfair in that there would be no consideration for fishermen's historical participation.

"There is no right to compensation to (quota) holders in the event the system is changed or revoked"

What is the government trying to do by implementing an ITQ based management system? If government's goal is to stop over-fishing and bring overcapitalization under control, with the fishery paying for these changes, then the fishermen's investment must be protected. If their investment is not protected, ITQs will be opposed by the industry and they will have no value as a management tool. ITQ can correct over-fishing and overcapitalization without government intervention, which may be the best reason for creating the system. Nonetheless, the fishery will not make the investment that an ITQ system requires without the expectation of financial reward.

Does ITQ promote "big business"?

An ITQ managed fishery should have some means to control the amount of ITQ controlled by large companies. However, this would be difficult because there are many ways large companies can disguise holdings. It should be noted, that more and more fisheries are being overtaken by large companies. Today, off-shore fishing is big business due to high costs for factories, vessels and gear, and their maintenance.. Big business is going to have an ever increasing roll in the fishing industry. A well crafted ITQ system can engender

efficiency and long term stability, which is attractive to large corporations and small businessmen alike.

Should small traditional fishing communities be protected from big business under an ITQ system?

ITQs aside, small, traditional fishing communities have rarely been protected from big business. It should remain this way. If a fishing community operates efficiently then it will prosper under an ITQ system. The inefficient communities will fail, with or without an ITQ system. Sooner or later the most efficient use of capital will prevail.

How might ITQs be structured so as not to contribute to increasing monopolization and concentration of ownership of fishing rights? How might the unacceptable concentration of ownership be determined for any fishery?

ITQs are designed to reduce overcapitalization. Concentration or consolidation is an objective of the management system. This is done to reduce the number of participants in the industry so that those who remain can exist without over-harvesting the resource. Concerning monopolization, each proposed ITQ management system must first determine how the fishery is structured before deciding what is an unacceptable level of consolidation. In the processing business in the surf clam/ocean quahog industry, each of the participants had consolidated long before the ITQ system was put into effect. The industry has had additional consolidation of processors and vessel owners. However, none of them are considered a threat at this time. The largest allocation owner/processor has a significant percentage of the ocean quahog resource. This company has done so poorly, that its owner is selling out. Therefore, it is clear that large operations in the clam industry are not a major problem because they tend to be inefficient In the future, it is conceivable that a large company could buy a vast share of the industry and monopolize. However, it is more likely that the industry will be reduced from the current eleven processing plants to five plants They will be owned by five different companies, with each controlling approximately twenty percent of the industry. It was anticipated that under the time allocation system, consolidation would take place. In the surf clam industry, it is not specified what share of the total clam industry a company can control. It is generally conceded that if a participant attempts to acquire more than fifty percent of the industry, the National Marine Fisheries Service will notify the Justice Department of a potential monopoly and the company would be carefully investigated. It is assumed that companies will take the National Marine Fishery Service's threat to investigate excess share holding seriously.

How might the unacceptable concentration of ownership be determined for any fishery?

The concentration of fishing share by a single company or group should be determined by the number of participants presently in the fishery. A company should also gain fishing shares by determining how many vessels it will take to catch the quota, given efficient fishing effort. Then, a numerical value can be set so that no individual or corporation can control more than the maximum share of ITQs, which would then eliminate the possibility of dominance by one individual corporation. It will be difficult, if not impossible, to be assured that this will always be the case because there will always be the possibility of companies trying to avoid direct ownership by having contractual arrangements with other companies, allowing them control. However, this can happen without an ITQ system.

If Magnuson was amended to allow collection of revenues in excess of the administration costs, would auction of quota shares be a preferred option?

Auctioning off ITQs does not solve the problem. The objective of the system is to eliminate overcapitalization, without governmental interference. Then, the system allows the industry to become more efficient by eliminating weak participants or allowing those who are interested in selling out to do so. As stated earlier, the government bears no cost in the process. If revenues must be raised, there should be an allocation user fee or tax, not an auction.

Under what circumstances should revenues for an ITQ program be used to finance a buyout compensation for compensating those who are forced to leave a fishery?

An ITQ system is a non-government buy-out program. Industry compensates the fishermen who leave the fishery. Consequently there is no need for a fee to fund a buy-out program. This is the objective of the system.

Is free market transferability of quota shares necessary?

If free transfer is not allowed, then there is no way to eliminate weak industry participants. They will remain until they fail. Often, they will blame the government for creating a system that has caused their demise. At some point, the quota will have to be set at maximum sustainable yield, instead of optimum yield. When this occurs. if the quotas are not transferable, the weak will be forced to remain in business. They would then bring political pressure to bear for higher quotas, which would result in over-fishing the stocks. These fishermen then either go bankrupt or transfer to another fishery, straining its stocks as well. ITQ transferability is essential for the system work.

What are the potential enforcement problems with individual quota systems?

The individual quota system, if designed properly, will require the minimum number of government regulations. The quotas will be enforced at the port of landing, reducing the necessity for at-sea enforcement by allowing enforcement agents to inspect catch dockside.

What is the enforcement experience where these have already been used?

Since the ITQ system went into effect in the surf clam/ocean quahog industry, enforcement has been minimal. Initially, there were a few violations that involved extremely high financial penalties. Once those examples had been made, the industry recognized that under the ITQ system violations would not be tolerated. A well drafted ITQ system requires less enforcement and costs less to enforce.

What impact do ITQs have on bycatch?

The surf clam/ocean quahog industry has no significant bycatch.. Since the fishery is conducted on the ocean floor, there is very little that is caught with the gear. The gear is specifically designed for catching only clams.

What about "high-grading" under an ITQ regime?

High-grading was not a problem under the surf clam/ocean quahog time management system, nor is it a problem under the ITQ based management system. The processors have always set the quality level regarding product size. In the clam industry, the larger clams are traditionally more valuable than the smaller ones. The processors have always required the industry to catch the larger clams, and that practice continues under the ITQ system. Typically, a vessel fishing for large clams will fish in different areas for small clams. It is not unusual for a vessel to have a much lower catch rate for the more desirable clams. The vessel is usually compensated by the processor for the lower catch rate.

Is this a greater problem with ITQ systems than in an open access fishery?

In the surf clam/ocean quahog industry, the practice of the catching the product that the processor wants is the same under both systems.

In recent US experience, what have been the more common criticisms of proposed ITQ regimes?

During the public hearing process for the ITQ system, the most common criticism was that individual vessel owners would not receive enough allocation to support their vessels. Since the industry was grossly overcapitalized and had a very stringent quota, this criticism was valid. In fact, this was the flaw in the existing management system that ITQs were supposed to correct. Another major criticism of ITQs was the formula that was devised to determine allocation share. This will always be a contentious issue, because everyone wants to get as much as they can. It is understandable that those who do not receive enough allocation to stay in business would disagree with the formula. ITQs were created to solve the problem of overcapitalization and eliminate the weak so that those remaining can prosper without pressing for higher quotas at the expense of the resource.

How have these criticisms been addressed?

Once the surf clam/ocean quahog ITQ system went into effect, the vessel operators who could not exist on the allocation that they controlled, either leased or purchased other vessels or sold their vessels to another fisherman. This allowed those who sold-out to leave the industry, without the need for government financing.

How do the data requirements for managing fisheries with ITQs compare to more traditional management regimes?

In the surf clam/ocean quahog regime prior to ITQs, the reporting of data was essentially the same as it is with the ITQ system. The only exception is that now tag numbers are to be recorded on the log books. This was not required prior to ITQs because tags were not used. However, all of the other information had always been required, and all of the log books had been filed giving the industry the most accurate long-term data base. These logs include what was caught, who caught it, where it was caught it, and when.

How much does this contribute to the cost savings or increased expense?

The cost for the government and the industry under the ITQ system and the surf clam/ocean quahog management plan is essentially the same for data collection.

What has been the impact of ITQ systems on jobs and harvester income?

Over the long term, the ocean quahog and surf clam industry was grossly overcapitalized. Under the time allocation system, as the fishing times were reduced per week, the crews were consolidated on to more than one vessel. The reason for this consolidation was that there was not enough revenue to support the crews without over-fishing the quotas. Consequently, when the ITQ system went into effect, the industry had one crew running two or three vessels. Once ITQs allowed consolidation, the surplus vessels left the fishery. Their allocation was placed on the remaining vessels. After that occurred, fishermen were fully employed on one vessel. For the most part, under the ITQ system. the harvesters make approximately the same amount of money that they did under the time based allocation system.

What can be anticipated for other fisheries proposed for ITQ systems?

Since the surf clam/ocean quahog industry looks at ITQs after the fact, not a lot of energy has been spent observing other fisheries and their proposed ITQ systems. However, it can be anticipated that in such fisheries as the black cod and halibut, the fishermen will make more money because fishing trips will be spread over a longer period of time. This will eliminate markets glut, and the fishermen will receive more for their catch. The crews will have a larger income for the same amount of fishing time. If consolidation is allowed, then the black cod and halibut fishery will become a full-time fishery.

Do you agree strict enforcement is necessary in an ITQ system?

The surf clam/ocean quahog industry has always been an advocate of strong and efficient enforcement. The industry continues to advocate this policy If widespread violations of the regulations are permitted, the system becomes unbalanced and the fishery unstable.

What do you envision as appropriate enforcement techniques?

Currently in the surf clam/ocean quahog fishery, there are provisions for closed areas and a size limit. However, at this point in time, there are no closed areas because there are no juvenile clams to protect. Since all of the clams in the EEZ are fairly old and have reached maximum yield per recruit or greater, the size limit provision has been suspended. An allocation holder has his allocation caught by a vessel which is required to report the catch. It is then sold to the processor who also reports the catch. The catch reports by the vessel and the processor must equal. These provisions can be enforced at the plant level, and if a shipment arrives that is illegal, it is easy to spot. Both the processing plant and the vessel that caught the illegal clams can be penalized.

In your testimony you objected to unreasonable regulations such as a "call- in" provision. What is entailed in the "call-in" provision?

The "call-in" provision requires each vessel captain or owner to call-in information regarding the proposed fishing trip to a NMFS recording before leaving the dock. Under normal circumstances that would appear to be a reasonable request, but after seventeen years the ocean quahog fishery has never had an at-sea violation. Thus, there is no reason for ocean quahog vessels to call-in. For these vessels, the regulation is unnecessary and unreasonable. The surf clam/ocean quahog industry did suggest that vessels that hold New Jersey in-shore surf clam permits, along with an offshore permit, call-in while the in-shore season is open. In the past, those vessels have had the most widespread violations. The industry recognized the problem and developed a solution. Rules created for enforcement sometimes go to far.

Questions from the Honorable William Hughes

A1. *Should the ocean quahog fishery in federal waters be managed apart from the rest of the east coast quahog fisheries?*

Prior to the ITQ system going into effect in 1990, the surf clam/ocean quahog industry knew that there was a quahog fishery within a three mile limit to the coast of Maine. Since these vessels fished in instate waters, they were not required to hold a federal permit or to file log books recording each of their trips. Just before Amendment 8 to the Surf Clam/Ocean Quahog FMP went into effect, the coast guard boarded a Maine vessel in the federal zone that was illegally catching ocean quahogs. The fishermen on the vessel stated that they did not

know that they had to obtain a permit to catch ocean quahogs in federal waters or had to file log books. Since these vessels had not filed logs on what they had caught in federal waters, which would have given them allocation equal to their yearly catch, they did not receive ITQ quota. The fishermen then brought political pressure to bear and demanded that they be allowed to catch quahogs in the federal zone. This request was granted on an experimental fishery basis. The Mid-Atlantic Council asked its Northeast Regional Director to write a secretarial amendment to the surf clam/ocean quahog plan addressing the issue of the Maine quahog fishery. The secretarial amendment went to public hearing in the spring and fall of 1993. It gave jurisdiction to the State of Maine from the three mile limit to the Hague line. The justification for this was paralytic shellfish poisoning. The State of Maine is required by the FDA to test shellfish for PSP because it is prevalent in Maine shellfish during certain periods. Maine had to certify that the shellfish were PSP free. Therefore, all clams were required to be landed in Maine. This amendment also implemented severe gear restrictions that would exempt everyone but Maine fishermen from fishing on that stock. This completely excluded any vessels not from Maine.

Once the amendment had been put forth for public comment, the industry responded by suggesting that it violated national standards, i.e. favoring one state's fishermen over another. The real issue is that the FDA requires the State of Maine to test for PSP regardless of what other management regimes there are If the state does not test, then their certification to ship shellfish in interstate commerce would be withdrawn by the FDA. Maine's contention that they had to control the fishery so that they could control PSP is untrue. In fact, the reason they wanted control of the fishery was because their fishermen had been caught fishing illegally. Remember, they would have received allocation if they had filed their log books. Simply put, the state and the fishermen do not want to be managed or controlled, and they have successfully manipulated the National Marine Fisheries Service to their own ends.

In a compromise proposal to the State of Maine, the industry suggested that they give the State of Maine allocation amounting to the number of bushels caught there. This would allow the state to distribute the quahog allocation to the fishermen and would give them central control. Their fishermen would be required to file log books, to have permits, and to follow all of the general rules that the rest of the industry is required to follow. The industry -had also suggested that if a southern vessel fished for quahogs in the Maine zone and did not land them in Maine, the vessel must test the clams for PSP before off loading. Testing would be at the vessels expense. The State of Maine continues to press for Amendment 9 to be implemented, as written. Maine has also suggested to the New England Management Council that the clam fishery in New England be regulated by the New England Council. The New England Council seems to be determined to have a regulation-free clam fishery.

A2. Has NMFS considered the effects that amendment nine might have on the ITQ system?

It is quite clear that the ramifications of the secretarial amendments that NMFS wrote was not thoroughly thought out. If the pretense of testing for PSP is used as the excuse for the State of Maine to take complete control of the fishery, then the State of Massachusetts should be allowed the same right. Massachusetts also has the responsibility of testing for PSP in its state waters, including Georges Bank which is now closed because of PSP. Currently, the State of Massachusetts has a moratorium on clam fishing vessels. They have size limits on the vessels and stringent limits on clamming gear. Massachusetts would prefer to isolate the rest of the industry from the surf clam ocean/quahog resource on Georges Bank, which is substantial. It appears that Maine had an enormous influence in the way Amendment 9 was written. It also can be concluded that in an attempt to avoid political pressure, the NMFS adopted the state's idea for management of the quahog resource in federal waters without contemplating the consequences of the proposed rules and regulations.

A3. Is there a separate quota for Maine's fisheries?

There is no quota for Maine quahog fishermen. The clam population in Maine's in-shore waters is very low due to over-fishing. No survey has been conducted for the quahog population off Maine, nor is there a set quota. It is clear that they do not want a population dynamics survey, because under the surf clam/ocean quahog plan, they would be required to have a quota. That would place restraints on the fishery, which they do not want. The National Marine Fisheries Service is attempting to have it both ways. They maintain that there is an insignificant fishery in Maine. The question is, are they over-fishing the stock? The state does not know, because they have not conducted any population studies. It can be assumed that they have grossly over-harvested the resource because they have already fished out the inshore waters which have no quota. Conversely, the National Marine Fisheries Service also maintains that Maine's fishery must be part of the national quota because there should be no separate quota. If the Maine fishermen are catching the off-shore quota, then they should be part of the management plan. The clam industry offered to give Maine fishermen allocation. That allocation would be taken from the federal quota. The Maine fishery declined the offer.

A4. Does Amendment 9, in effect, restrict the non-Maine resident from fishing in the state by creating a landing law and gear restrictions that are unique to Maine?

Under Amendment 9, Maine has created a situation where only Maine fishermen can fish for ocean quahogs or surf clams in federal waters in the northern half of the state.

A5. Were Maine vessels fishing illegally in the EEZ before Amendment 8 went into effect? Why were they not issued quahog allocation?

When this question was addressed in the past, it was found that Maine vessels were fishing in the EEZ without permits, and without filing log books. These are violations punishable by huge fines. None of those vessels received fines for breaking the law.

Quahog allocation was issued to vessels in New England depending on the average catch for years fished. Averages were calculated from landings reported in official log books supplied by the National Marine Fisheries Service. If the vessel did not have a permit, then it was not required to fill out a log. If a log was not filled out, then the vessel did not receive an allocation. The Maine fishermen stated that they were fishing off-shore, but that they still wanted free access to the fishery. The industry reminded them that if they had completed log books they would have been allocated the clams. It is inconceivable that the Maine fishermen will use the excuse that they had fished out the in-shore stocks, so they were forced to fish off-shore.

A6. What steps has the NMFS taken to work with the rest of the quahog industry to the issues surrounding the Maine fishery?

The clam industry, through the regional directors office, tried to develop a compromise plan. The industry suggested that they give a portion of their allocation to franchise the Maine fishermen. Under this proposal, the Maine fishermen would be brought under Amendment 8 and receive a share of the quota, even though they had not reported catch under the terms and conditions of the FMP. The Maine fishermen turned down that proposal, preferring to stay with Amendment 9, which is essentially no restrictions or quota management.

Dick Roe, the Regional Director of the National Marine Fisheries Service, under pressure from the Mid-Atlantic Fisheries Management Council, allowed the council to take over Amendment 9. The council is attempting to find a compromise position.

B1. Why did the NMFS decide to include allocation sanctions in the penalty schedule under the surf clam \ ocean quahog management plan?
B2 Has NMFS studied the effects of possible sanctions on the lending industry's willingness to loan money for the purpose of purchasing ITQs?
B3 What steps is the NMFS taking to ensure access to credit and maintain the stability of the ITQ market?
B4 Is it true that, under the revised penalty schedule, ITQ owners could loose their allocations through the actions of a contractor or subcontractor?

The National Marine Fisheries Service decided that the existing penalty schedule authorized by Congress was inadequate. To correct this fault, they determined that under the ITQ system they could issue allocation sanctions, and that they could do this administratively without benefit of public hearings or industry review. The existing penalty schedule for possession of illegally caught clams is as follows: The vessel owner, the captain of the vessel, the unloading dock owner, the transporting trucking company, and the shucking plant owner can all be fined $1000,000 each. In addition, the vessel can have its clam fishing permit revoked or suspended. Processing plants' permits can suffer the same fate. The industry thought that a $5000,000 fine per violation, possible loss of operating permits, or possible vessel forfeiture was quite a deterrent. The National Marine Fisheries Service and NOAA General Council did not concur.

The problem with allocation sanctions is that ITQs are not a property right. Therefore, the banks cannot take a security position on the allocation. This creates a situation where only companies who can purchase allocation outright can acquire allocation. In the past, allocation has been used as collateral. It was signed over to the bank until it was paid for. It was then transferred to a the owner. If sanctions are permitted to stand, no bank will take possession of allocation as collateral because a violation by the vessel under contract could result in the loss of the allocation. There would be no recourse for either the bank nor the purchaser. This creates a system whereby only large corporations can buy allocation. It excludes the small independent fleet owners who must be able to purchase allocation to stay in business. Another problem with this proposal is that most of the allocation caught today is not caught by the allocation owner. Most vessel owners lease allocation and then contract to sell the catch to processors. If allocation sanctions are permitted to stand, then only the vessel owners who own large blocks of allocation and can guarantee the replacement of lost allocation with their own, will be able to catch clams under the ITQ system. For example, this excludes the fishing captain who wants to purchase a vessel to catch contract allocation because he cannot post adequate guarantees to protect the allocation. In effect, he is barred from the industry. There is a further inequity in the sanction concept, an example of which follows: Company A has a thousand bushels of allocation, while company B has a million bushel allocation. Both are found in violation, and have sanctions levied against them for 50% of their allocation. Company B, with much more allocation, has a penalty of millions of dollars. The industry feels that the allocation sanction concept is misguided in that it is not equitable for all participants.

The clam industry suggests that all clam captains be licensed. Most violations are committed by boat captains, If they were licensed, then the violators' license could be suspended or revoked. The National Marine Fisheries Service maintains that licensing captains is not government policy. Despite this, they have licensed all ground fish fishermen and scallopers in the Northeast. As a consequence, the industry feels that it would be appropriate for the National Marine Fisheries Service to reconsider sanctions. In the event of a violation where leased allocation is involved, those who committed the violation, the captain and/or the vessel owner, should be penalized, not the allocation owner.

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Testimony
of

WALTER M. GORDON, JR., President
MID-ATLANTIC FOODS, INC.

before the

Subcommittee on Fisheries Management
Committee on
Merchant Marine and Fisheries
U.S. House of Representatives

February 9, 1994

Mr. Chairman and Members of the Subcommittee:

I am Wally Gordon, and I would like to begin with a brief introduction of myself and my company.

I began my career in the grocery products industry in 1966. For fourteen years, I held various positions in sales and marketing with both regional and national food companies. In 1980, I became involved in the clam business as the Director of Marketing for American Original Corporation in Seaford, Delaware. Currently, I am the President and majority stockholder of Mid-Atlantic Foods, Inc., located in Pocomoke City, Maryland, and Gordon's Seafood, Inc., located in New Bedford, Massachusetts.

I am active in a number of trade organizations. At present, I serve as a Regional Vice President of the National Fisheries Institute, as well as a member of their Board of Directors. I am the immediate past president of the Mid-Atlantic Food Processors Association. I am an appointed member of the Surf Clam and Ocean Quahog Industry Advisory Committee to the Mid-Atlantic Fishery Management Council, and have participated in most, if not all, of the Council's meetings where Amendment 8 ITQ's were discussed.

Mid-Atlantic Foods was formed in 1982 to process canned clams, clam juice, chowders, and various seafood products. We currently employ 67 people in our Pocomoke City operation, and do business nationally and internationally. Mid-Atlantic Foods services both the retail and foodservice markets, and I believe that we are currently the second largest supplier of canned clam products to the foodservice industry.

Gordon's Seafood was formed in 1993, currently employees approximately 50 people, and is a clam shucking operation which processes both fresh and frozen products.

I am here today to testify about the effect the ITQ quota system has had on the Surf Clam and Ocean Quahog Fisheries, and to recommend issues which should be considered before implementing ITQ's in other fisheries.

While my company has been, and will continue to be, disadvantaged by the way ITQ's were implemented in the clam fishery, I would like to empathize that I am <u>not</u> here to recommend any further tampering with Amendment 8. Any manipulation could only further damage my company and my remaining suppliers. Amendment 8 is in effect, and the industry is adjusting. Amendment 8 needs to be finalized and made more permanent. It is the lack of permanence in the amendment which puts many participants in the industry to such a disadvantage.

I attended a White House briefing in 1992 which was addressed by Dr. John Knauss, a senior NOAA official, who made a statement to the effect that...the we chose to experiment (or test) ITQ's in the clam industry because it is small industry and we could not hurt anything. That statement is indicative of an attitude which forced the current plan on our industry, in spite of opposition by a high percentage of industry participants.

It is my opinion that ITQ's were allocated unfairly in the surf and ocean quahog fishery. The amendment gave great wealth to some and huge advantages to others, while placing serious obstacles at the independent processor's door. Three years after implementation, I am still adapting to a rapidly changing industry. The obstacles are still in place. My message is, "Oh, no! Please don't help me again!!"

In the following testimony, I will try to address the questions posed by the Committee, tell you how ITQ's are affecting my company as well as the industry, and suggest recommendations which should be considered before implementation in other fisheries.

First of all, we need to decide what we are trying to accomplish and the type of fishing industry we want to have in this country. An ITQ system as implemented in Amendment 8 to the Mid-Atlantic Fishery Management Council's Surf Clam and Ocean Quahog Fishery Plan will lead to a few vertically integrated corporations controlling every aspect of the industry from harvesting through marketing. If we want to maintain the traditional fisheries in the hands of independent fishermen and fishing families, and have a variety of processors (large and small, new and old), we must use a system other than ITQ's, or structure ITQ's differently than they are structured under Amendment 8.

Any quota system must be bankable. Financing must be available through normal commercial sources. To be bankable, it must have stability, a tangible value, an acceptable method of transferring ownership, and enough potential owners to ensure a market. To be fair to all participants, as well as the American public, it must have ownership limits, and reasonable constraints to prevent price manipulation and the creation of artificial shortages.

Initially, ITQ's have a shock affect on the industry. Multi-vessel owners who receive substantial ITQ's have various options: (a) They can reduce the size of their fleet thereby becoming more efficient. The dollars available from this fleet reduction can then be used to purchase additional quota enabling them to become even more efficient. (b) They can cash out, and rent their ITQ's back to the remaining participants. This windfall in the tens of millions of dollars is permanent and the dollars are out of the industry. Efficiency is not promoted, nor is the search for new resources or the development of new technology. It becomes a permanent leach to the industry and to the American public. At today's prices, an ITQ owner with approximately one percent of the surf clam quota can retire with an on going annual income of $200,000.

Single vessel owners or those without sufficient amounts of ITQ's to fish economically must either (a) sell out, (b) buy ITQ's with dollars from an outside source; or (c) form an arrangement to sell their catch to a processor with allocation and in return fish enough of the processor's ITQ's to become efficient.

This becomes a significant burden to an independent processor unable to finance the purchase of non bankable ITQ's. A large public corporation simply takes cash or credit backed by its other operations and funds the purchase of ITQ's. Small fishermen, who were selling to processors without allocation and who are unable to fish their limited ITQ's economically are forced to switch and fish for a processor who can offer them additional ITQ tags. (Fish your ITQ's for me and I'll pay you a catching fee to fish an equal quantity of my ITQ's). Because of the "fixed" expense of maintaining, insuring, and operating a fishing vessel, the owner's profit does not double, it quadruples! I have lost a significant percentage of my supply due to this kind of leveraging tactic. Every major processor, except one who stood to receive approximately 25% of the ITQ's opposed Amendment 8 as it was implemented. Shortly after implementation, this one supporting processor sold out. Other processors who were in a position

to finance the purchase of ITQ's began to do so.

One of the initial aims of the Mid-Atlantic Fishery Management Council was to reduce over capitalization in the industry. They were spectacularly successful in the harvesting segment. However, for every capital dollar reduced in the fleet, the system has multiplied it many times over and placed the burden on the processors. We in turn have no choice but to pass this cost along to our customers. As a point of reference, in the three years since the implementation of Amendment 8, my cost of shellstock has increased from one third to over fifty percent depending on specie and quality - much faster than the C.P.I. While it has reduced over capitalization in the harvesting segment, it has become almost impossible for an individual to follow the American dream by starting out as a crew member, learning and working his way through mate to captain, and eventually buying his own vessel and becoming and "independent fisherman".

Prior to Amendment 8, an individual could have purchased a high quality, fully licensed fishing vessel at a cost in the neighborhood of $750,000 to $1,000,000. This was a bankable purchase. An aggressive fisherman could then harvest in the neighborhood of 35,000 bushels of surf clams and 150,000 bushels of quahogs, and properly managed would have a "doable deal". Under today's system, in addition to the boat, an owner would have to purchase ITQ's at a cost in the neighborhood of $2,500,000. Currently, this is not a bankable purchase. It, therefore, restricts new entrants to the industry to large corporations or to individuals with substantial assets.

This country has a great tradition of encouraging, and even protecting, the US fisherman. Vessels fishing in the EEZ must be US built vessels. They must be owned/controlled by US citizens, and even the radio operator must be a citizen and must communicate in English. ITQ's as implemented in Amendment 8 allow outside interests, speculative players, and even foreign nationals / corporations to own and control the rights to our natural resource. This has already happened, and it will continue to increase.

Ultimately, vessel crews will receive less money per unit of catch. Crews will be paid a percentage of the catching fee rather than the traditional percent of the catch's value.

Recently, Doug Hall, Assistant Secretary of Commerce for Oceans and Atmospheres stated in an address to the National Fisheries Institute that there was pressure from the Administration to explore the use of user fees. I submit that ITQ's as implemented in Amendment 8 have created a user fee system. The fee being paid by the American consumer, unfortunately is going elsewhere.

In conclusion, I would like to take a moment to summarize how our company and other independent processors have been injured by Amendment 8:

1. Our cost of quahog shellstock has increased by thirty-three percent.

2. Our cost of surf clam shellstock has increased in excess of fifty percent.

3. We have lost valuable, long term suppliers that can not replaced:

    a. Some have sold out and retired.
    b. Some are lost to competitors on "buy one/get one" or similar schemes.
    c. Some were lost to competitors who financed their purchase of addition ITQ's.

4. We have been forced to buy from state resources, often increasing our costs and lowering our quality.

5. We must compete against vertically integrated processors who were given ITQ's. Since independent processors are currently paying as much to rent a surf clam tag as they used to pay for the shellstock before Amendment 8, I would suggest that an independent processor can be at a distinct economic disadvantage.

In spite of all my negative comments on Amendment 8 and how it was forced on our industry, I ask that you do not try to "fix it"!! Under the rules that the Mid-Atlantic Fishery Management Council imposed on our industry, many good companies and, even more importantly, independent fishermen have spent millions of hard earned dollars to adapt to the new system. Unless you are prepared to reimburse this investment, almost any change will have a catastrophic effect on the industry and its participants.

I suggest that this be made a bankable ITQ, and that we stop trying to manage it or fix it.

If your decision is that the advantages of an ITQ system outweigh the disadvantages, then I submit the following recommendations for your consideration:

RECOMMENDATIONS FOR ANY ITQ SYSTEMS

1. Any plan must be bankable! To be bankable (financing available through normal commercial sources) it:

    a. Must be a "property right" not subject to revocation.
    b. Must not be threatened by confiscation as proposed by NMFS.
    c. Must not be subject to micro management in an effort to right every grievance.
    d. Must have a method to readily transfer ownership and thereby, establish reasonable value.

2. Ownership by any one entity must be limited.

3. Ownership must be limited to entities who own or operate vessels, thereby keeping speculators out of the resource.

4. The value of the ITQ's must be in "the right to fish, free of unnecessary restrictions", rather than in speculative ownership.

5. The plan must prevent the ability of an ITQ holder to withhold product from the market to manipulate the price.

6. The plan must have a method to initially distribute allocation on a fair and equitable basis. Inflation of catch, or a history of cheating, etc. should not enhance an owner's initial ITQ receipts, as it did under Amendment 8.

7. There should be an initial cost to ITQ owners, or a way to prevent a windfall to the recipients and an untenable burden to non-recipients.

8. Any future ITQ plan must be suited to the particular fishery which it is intended to manage.

I thank you for your consideration of my comments and my recommendations.

STATEMENT OF THE CENTER FOR MARINE CONSERVATION

Before the Subcommittee on Fisheries

House Committee on Merchant Marine and Fisheries

February 9, 1994

Good afternoon, Mr. Chairman and Members of the Subcommittee. My name is Roger McManus, and I am the President of the Center for Marine Conservation. We appreciate this opportunity to respond to your questions and to provide our views on the subject of Individual Transferrable Quotas. The Center has been investigating the benefits and consequences of ITQs as a fishery management tool for several years. We published in 1992 an examination of the economic forces driving overfishing in a small book called "Why People Catch Too Many Fish." In the fall of 1992, we sponsored with the World Wildlife Fund a conference on limited access systems, bringing together academics, resource managers, economists, conservationists and fishermen from all over the world. The final report of that conference, including all the papers presented, is about to be released. This examination led us to oppose the recent approval of the ITQ program for halibut and sablefish in the Gulf of Alaska, for reasons which I will detail in our response to the questions you raised in conjunction with this hearing.

As you examine the application of ITQs in U.S. fisheries during your deliberations on the Magnuson Fishery Conservation and Management Act, we would urge you to proceed with caution. The choice to alter fundamentally the relationship between the public and public resources, to change a centuries-long tradition of open access to the sea, is not one to be made lightly or without due consideration of the possible alternatives and their consequences. We do not believe that implementation of ITQ systems in all U.S. fisheries is either practical or desirable. We disagree strongly with those who offer them as a panacea for every problem in fisheries management from overfishing to safety to bycatch and waste. Indeed, without substantial change in the Magnuson Act to compel councils to use the basic management tools that exist already, such as defining overfishing and setting timetables and deadlines to rebuild depleted stocks, ITQs will be little more than an economic allocation mechanism to guarantee harvest shares on stocks that continue to be managed into decline and depletion. Finally, we are wary of a rush to get all U.S. fisheries under ITQ systems as a quick means to bring sorely needed additional financial resources to the budget of the National Marine Fisheries Service.

ITQs may have many benefits, about which you will no doubt hear today. Our testimony will sound more of a cautionary note, with observations on the following issues: 1. we oppose any quota system that privatizes public resources; 2. we oppose any quota system that gives away the public's resources without compensation; 3. implementation of limited access programs, including ITQs, must be evaluated and designed on a case-by-case, fishery-by-fishery basis; 4. nonetheless, there are certain elements that must be present in any system of limited access if it is to be effective in conservation.

<u>1. A system to limit access to fisheries, even one that grants individual catch quotas, must not privatize public resources.</u>

There are many aspects of ITQs that have the ring of property. They have value, they can be bought and sold, they can be used as collateral to get a loan, they may potentially be sized as assets by the Internal Revenue Service. The owners of the quota shares have exclusive use of them. These are the very aspects of ITQs that economists argue will cause holders of shares to behave in a different way than users of a common property resource. It is this sense of ownership, according to economists, that causes the ethic of stewardship to blossom, and brings about care and conservation of a resource because the owners have an economic self-interest in preserving it so they can continue to use it beneficially for a long time.

Without getting into a lengthy discussion of how applicable this theory is to fishing, we would point out that perhaps it's not so simple, and perhaps some people fish for reasons

other than maximizing profit. I don't have any concrete suggestions for how resource economists can crank into the equation qualitative values such as lifestyle choice, community tradition, cultural diversity and so forth, but I do know that I am not comfortable with the theorists' assertion that maximizing economic return is the major factor that informs our choices about how and why we fish.

More importantly, we find it difficult to accept that ownership in and of itself creates stewardship. It may create incentives to fish more slowly and carefully, to deliver a better product to market, to fish more selectively. But how does ownership give rise to a commitment to take into account the other public values related to conserving fish in the ecosystem? We don't think it does. Conservation for those values must, in the end, reside with the steward of the public's trust resources--the government. And for that reason, ownership and control must remain in the public sector.

This is the position of the current administration, and we encourage the Congress to go on record to affirm it. I have attached for your information a letter from D. James Baker, Under Secretary for Oceans and Atmosphere, which states in part:

> "This administration does not advocate privatization of public living marine resources. The establishment of ITQs does not confer private property rights, nor do holders of quota shares own the resource. Rather, this type of fisheries management distributes transferable harvesting privileges of the allowable yield specified under a fishery management plan (FMP). An ITQ will necessarily have some characteristics and advantages of private property since holders of shares can treat them as a negotiable instrument that can be bought, sold, or leased. But ownership and control of the resource remains in the public sector."

The question then remains, once you put share holders on notice that the extent of the bundle of rights they have in the ITQ is limited by government, will there remain sufficient economic incentive for them to treat their shares with an eye to the future? Or will they just fish them as fast and hard as they would under an open access regime? The proper balance between "soft" rights of access that may be restricted or revoked, and "hard" property rights that provide sufficient business predictability and expectation to create incentives to conserve, is one we should strike with care.

2. Initial awards of shares under an individual quota system must carry a price to compensate the public for its resources.

A second major issue within the ITQ debate is that of compensation for the commercial harvest of public resources. It was this failing primarily that led Center for Marine Conservation to oppose the recent adoption of an ITQ program for halibut and sablefish in the North Pacific. Not only, in that case, was the government creating a vast windfall for recipients of the quota shares at public expense, it also was admitted that the agency did not have sufficient budget to implement, manage or enforce the program as adopted.

Management and enforcement of ITQ systems can be more costly than traditional management approaches for a variety of reasons. For example, the very lack of seasonality that makes ITQs appealing (no derby, better product handling, market availability, etc.) brings the requirement that enforcement activities occur at all times of the year in all possible fishing areas, rather than on the grounds during the "season." the potential for highgrading, bycatch, and cheating is not eliminated with ITQs, and may, according to some of the literature, be exacerbated.

Leaving aside the question of compensation for normal fishing activities, currently proposed ITQ systems will convey enormous financial windfalls to a privileged few with no

compensation to the public that has to continue to pay for the costs associated with the management (and in some cases otherwise subsidize fishing operations), much less receive profits from the use of their property. (The Center currently is conducting a study on the government subsidies for the fishing industry.) Such arrangements fail to internalize the economic and environmental costs they bear, as may be reflected by the abuses public lands have suffered from subsidized mining, livestock grazing and timber production.

We are facing squarely the question of getting a fair return for resources from public lands. It is unthinkable that we should get nothing in return for parcelling out the bounty of our nation's ocean resources. It makes good sense that users of the public domain pay their fair share--for getting exclusive access, for their use of the resource, and for the costs of implementing, managing, and enforcing the program.

The Center believes that the use of auction payments, transfer fees, taxes, rents, royalties, or other fee collection mechanisms must be examined to get money from the use of fish back into the task of conserving and managing the fish. Such mechanisms should be resolved and in place before further ITQ programs are established

In order to do this, we must amend the Magnuson Act to allow NOAA to collect more than just the administrative costs of program management. I have attached recommended language for achieving this objective, which is also supported by the Marine Fish Conservation Network.

3. Implementation of limited access programs, including ITQs, must be evaluated and designed on a fishery-by-fishery basis.

Limiting access to fisheries is a means to prevent overfishing where effort is the cause of overfishing; that is, where the fishery is "overcapitalized" and you want to get some people out of the fishery. We must be careful to evaluate first the causes behind the depletion of the fish in question. While it is true that far fewer boats are needed these days to catch what's left of Pacific salmon, for example, what incentive would be created by decapitalizing the West Coast salmon fleet, and putting the few remaining boats on ITQs, when they know the continuing decline of the salmon runs will be driven far more by water policy than by their catch rates?

On the other hand, if the fish in question are declining or depleted because we have too many boats chasing too few fish, then that fishery might be a candidate for limiting access through ITQs. In all cases, the first step to limiting access is a moratorium on new entrants to the fishery. Until we have a better balance sheet in terms of the number of overutilized species in this country, we should be discouraging new capital investment in U.S. fisheries not only through our fisheries policy, but through our tax policy, loan programs, and any other incentive programs the government has at its disposal.

Once a moratorium is in place, there are many ways to further limit access and reduce fishing effort. These means are directly related to the nature of the fishery and should be evaluated on a case-by-case basis. ITQs and other quota share systems are just one of the variety of means to limit access.
In considering whether to implement an ITQ proposal for a particular fishery, we believe a number of questions must be asked:

- Is the ITQ proposed solely as an allocation (i.e., "economic rationalization") measure, or is it a means to reduce effort and thereby reduce catch?
- Does the fishery lend itself to decapitalization, that is, is there a likelihood of putting many vessels out of work, and what are the social and political consequences that will have to be faced?
- Does the ITQ pose conservation problems such as incentives to highgrade or increase problems with bycatch?

- Is the ITQ proposed as a conservation measure? Does it correct the conservation problems it purports to address?
- Have traditional management measures failed to solve those problems? And if so, is it because they can't, or because managers have not implemented them fully?

In our evaluation of ITQ systems as a conservation tool, certain criteria repeatedly surfaced that seemed to contribute to the success or non-success of a program to help achieve conservation benefits:

1. The smaller the fishery, in terms of vessels or participants, the more feasible the monitoring and enforcement.
2. The fewer the buyers, processors, and ports, the more feasible the monitoring and enforcement.
3. The better the health of the stock at the time the program is implemented, the more likely the fish populations will be managed sustainably.
4. Sedentary species are easier to manage.
5. Single species fisheries tend to preclude the occurrence of most bycatch.
6. Previous experience with some form of limited access system provides an information base that is helpful to successful TAC-setting.
7. Restrictions on transferability prevents quota shares from accumulating in the hands of faceless corporations, domestic or foreign, which may not adhere to a conservation ethic.
8. Cooperation from the industry through comanagement facilitates enforcement and information-gathering.
9. Supplemental regulations *must* accompany quota allocations to ensure the use of less wasteful gear, protect species from being harvested at particularly vulnerable times, such as spawning periods, require minimum size restrictions to ensure suitable recruitment stock, and prevent overcapitalization by restricting effort and capacity of gear and vessels.
10. Some species are not conducive to being managed by quotas, such as salmon (which require a certain amount of escapement usually determined at different times during the season), "flash" fisheries, complex multispecies fisheries, or size-dependent fisheries where quota management leads to excessive bycatch, highgrading, and waste.

The evaluation of the fishery and the design of the system must take place with all the stakeholders at the table--including public stakeholders who are not looking for a share of the quota to catch. It is important that the design of the system be an open, participatory process in order to incorporate the entire array of community values and expectations--values and expectations that may not be capable of being reduced to economic units or market analysis.

<u>4. If a limited access system is to be effective at conserving our fish, it must contain certain essential elements.</u>

At the outset, any system to limit access must be clear that what the government is granting to the user is an access privilege, or, in the case of ITQs, a share of a quota. The ownership of the resource must clearly remain with the government, which ultimately retains the authority to limit taking by lowering the overall catch quota, imposing conditions or restrictions on the manner of catching, or requiring other actions that are designed to conserve the fish and the ecosystem. In addition, the following elements are essential:

1. a cap on effort;
2. in fisheries that already have too much effort, an effort reduction plan in addition to allocation of access rights;
3. supplemental regulations to promote conservation, including selective gear restrictions, area closures to protect spawning fish and other vulnerable populations, bycatch restrictions, habitat protection, etc.;
4. sufficient knowledge of the fish population and biology prior to implementation;
5. conservative or cautious TAC setting.;
6. improved research and data management; and

7. enforceable rules, including those that limit participation, require increased observer coverage and monitoring, or impose stiffer penalties.

Finally, it should be stressed again that until U.S. law is changed to allow for the collection of royalties, it is poor policy to divide up the fisheries and give them away to fishermen. We cannot support giving the resource away for free, nor do we advocate managing marine ecosystems in a way that precludes their sustainability for the future.

CONCLUSION

Over a decade ago while I was working in the Executive Office of the President, first for the Carter Administration and then under Reagan, I thoroughly reviewed the literature on the pros and cons of privatizing wildlife. Most of the literature then published promoting privatization, was sophomoric in its analysis, particularly for its ignorance of basic biology and for its construction of dubious economic rationales as to why owners of such resources would naturally seek to maintain them for sustainable use. Still, I thought the tool may be applicable in some cases, for example, the management of deer on the lands of timber companies. Unfortunately, I was never able to convince the proponents of privatization or the Reagan Administration to set about critically examining the biological, economic and legal elements or regimes under which privatization of wildlife may be identified as a preferred management regime.

From my review at that time and with my experience since then, I view privatization of terrestrial wildlife as an alternative only in a few possibly highly defined circumstances. Privatization of marine wildlife enormously complicates our ability to conserve their populations and does not even begin to address consideration of their roles in their ecosystems.

In the final analysis, ITQs offer no magic bullets to stem the decline of our ocean fisheries. What has been lacking, in my view, is not economic incentive to conserve, but political will to uphold and enforce the objectives of the Magnuson Act. If we amend the Act, as recommended by the Center and others, to remove the ambiguity over whether conservation and sustainability are the standards by which we manage, and then the Council's live up to those standards, there would be plenty of fish to go around. Then we wouldn't be using contorted arguments of economic theory to make palatable the tough political reality that we got a bunch of people into fishing over the last 18 years, and now we're trying to figure how to get them out.

Thank you Mr. Chairman, for this opportunity to comment on a most important reauthorization issue. I will be pleased to answer any questions from you or the Subcommittee.

TESTIMONY OF THE ENVIRONMENTAL DEFENSE FUND

CONCERNING

INDIVIDUAL TRANSFERABLE QUOTAS FOR FISH HARVEST PRIVILEGES

BEFORE THE UNITED STATES HOUSE OF REPRESENTATIVES

COMMITTEE ON MERCHANT MARINE AND FISHERIES

SUBCOMMITTEE ON FISHERIES MANAGEMENT

FEBRUARY 9, 1994

Presented by:

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Good afternoon, and thank you inviting us to testify on ITQs as a fishery management tool. We represent the Environmental Defense Fund (EDF), a nonprofit, non-governmental organization that uses science, economics, and law to create lasting solutions to environmental problems. EDF has six offices around the nation, and 250,000 members.

To decide whether Individual Transferable Quotas (ITQs) represent a useful tool for solving the fisheries crisis one first must diagnose the crisis -- what are the causes of the collapse of fishery after fishery in the United States? Bad judgment by fishery managers, greed and even corruption have no doubt played roles. We at EDF believe that more fundamental economic pressures underlie the more obvious immediate causes, however. Conventional open access fishery management has created economic incentives to overfish -- incentives too strong for even well-intentioned fishers and managers to resist.

After considerable research EDF has concluded that ITQs represent a promising fishery management tool that Congress should support -- though, cautiously. ITQ-based limited access fishery management offers a chance to turn destructive economic incentives into positive ones. ITQs offer hope that the sad, long-term loss of fishing industry jobs that has so devastated many coastal communities can be halted and hope that this country's battered marine ecosystems can be saved from further decline.

EDF staff have recently authored a detailed report on ITQ-based fishery management, entitled "Achieving Sustainable Fisheries in America with Incentive-Based Limited Access Policies." EDF's report, currently in draft and being circulated for comment, elucidates the pros and cons of ITQs. From our investigation, it is clear that ITQs eliminate incentives that result in the "race for fish" -- a destructive characteristic of open-access management. ITQs also create strong incentives among quota-holding fishers to support management decisions that enhance conservation and stewardship. As a result, ITQs reduce pressure on managers to compromise the health of fish populations to avert short-term economic crisis. ITQs achieve this result by increasing profits, stabilizing revenues, and increasing the predictability of management.

It is absolutely critical to recognize that ITQs are only a tool, however, and will help save fisheries only if managers use them with other important tools. Iron-clad harvest limits, must be imposed if ITQs or any other management tool are to be effective. Fishery managers must set a total allowable catch, or TAC, in virtually every fishery, and the TAC must reflect a broad range of values, including the protection of diversity within fish populations, the protection of the ecosystems of which fish are critical components, and the protection of biological diversity. Today, in that limited number of fisheries in which TACs are regularly set, TACs simply reflect the need to leave enough fish to ensure a harvest next year, and they often do not even achieve that short-sighted and inadequate goal. Other necessary management tools include gear restrictions and incentives to minimize wasteful bycatch.

There is very strong evidence that ITQs reduce or eliminate the race for fish that has destroyed, and that continues to destroy, fish populations and fishing profits all around the country. You are all no doubt familiar with this syndrome, which has resulted in the absurdity of a 48 hour season for halibut, with an intolerable cost in human lives, bycatch, ghost fishing from lost gear, and market gluts.

By guaranteeing fishers a certain portion of the TAC, ITQs eliminate the incentive to race and to overcapitalize. ITQs ended the race for fish in fisheries in New Zealand, Australia, British Columbia, and Newfoundland, as well as in the US wreckfish, surfclam, ocean quahog, and Green Bay yellow perch fisheries. In fact, ITQs have ended racing in most of the fisheries in which they have been used. In some cases, racing persisted to exploit high

fish densities and market conditions, but it soon ended if fishers were not penalized for leaving part of their quota unfished. The end of the race for fish should save lives, increase profits, reduce pressure on managers to set unsustainable TACs, reduce ghost fishing, and perhaps increase the survival rate for discarded fish by allowing fishers time to handle bycatch more carefully.

Few studies have been conducted on how effectively ITQs create incentives for stewardship. Anecdotal evidence, however, and those studies that have been done to date, all support the view that ITQs cause fishers to place greater value on their interest in the future of the fishery than do fishers under open access management. For example, wreckfish fishers dropped their opposition to a TAC reduction and New Zealand fishers actually opposed a move to increase the TAC for hoki. The fact that wreckfish, surf clam and ocean quahog quota shares command much higher sale prices than do one-year leases of the same percentage shares indicates that quota-holders attach real value to their stakes in the future of the fishery. Fishers in these fisheries expect a future stream of revenues from their quotas, and value them accordingly. In addition, compliance with TACs improved dramatically as a result of ITQ management in Canada and Australia. Substantially increased profits, greater economic stability, and the fact that quota-holders have an economic stake in healthy fish populations have apparently eased pressure on managers to compromise conservation for short-term economic gain.

In addition to increasing compliance with TACs and creating incentives to conserve fish populations, ITQs are likely to decrease bycatch by reducing total fishing effort. ITQ management has also encouraged more ecologically sound fishing practices in Australia and the US wreckfish fishery, where bans, limited entry, and other conventional measures all had failed previously.

Some of the failings that critics have attributed to ITQs are in fact failings that plague all forms of fishery management, including inadequate enforcement, inadequate assessment, data-fouling, cheating, highgrading, and dumping. ITQs do appear to create incentives for highgrading, but it must be recognized that trip limits, commonly used to extend seasons under open access, also result in extensive highgrading.

EDF has concluded that many of the problems that have arisen in ITQ programs can be solved by carefully choosing fisheries for ITQ management and by better ITQ program design and implementation. ITQs are probably not suitable for all fisheries. It is critical to note that those ITQ programs that have been implemented to date have not been designed expressly to maximize conservation benefit. Non-government and non-industry environmental and marine conservation groups have had little if any involvement in ITQ program design to date and we believe opportunities have been missed to enhance conservation benefits through better program design. Further ITQ implementation in the U.S. should proceed only under a firm mandate to achieve maximum long-term conservation benefits and only with much broader public involvement.

EDF strongly supports the legislative proposals of the Marine Fish Conservation Network for amending and strengthening the Magnuson Act. EDF staff worked hard with others in the Network to help draft this unprecedented proposal put forth by a new, broad-based coalition of environmental and marine conservation groups that includes organizations of commercial and recreational fishers. The Network proposes many urgently needed amendments to the Magnuson Act, including mandatory recovery plans for depleted fisheries, citizen suit provisions, tougher conflict of interest disclosure requirements for Council members, restrictions on and incentives to reduce bycatch, and stronger provisions for protecting marine habitat.

In addition to these needed reforms we support the Network's proposal to amend the Magnuson Act to eliminate the existing prohibition in the Act (Section 304(d)) against charging fees that exceed certain limited administrative costs. This amendment would allow the direct beneficiaries of the regional council fishery management system to shoulder a fair share of the costs of research, management and enforcement. The amendment would also allow assessments on the economic rent or capital value of ITQs, which should form the principal source of revenue to cover ITQ program costs. It would also enable Councils to use auctions, where appropriate, in the initial allocation of quota shares.

The major challenges to the Councils and the National Marine Fishery Service in implementing ITQ plans are the same challenges that will have to met no matter what type of management is used. We will need better enforcement, better and more ecologically-based TACs, equitable allocation formulas, and programs to ease the pain of transition from overcapitalized fisheries to sustainable fisheries.

ITQs may initially increase the management burden on NMFS and the Councils because good ITQ program design, including the initial quota allocations, requires an arduous, time-consuming process. However, ITQs will decrease the burden in the future by eliminating the need to engage in contentious debates about the allocation of fishing privileges after the initial allocation is made. Market forces will take over this function.

The integrity of an ITQ-based management program, as with any other form of management, will depend on strong, efficient enforcement of the rules. In some fisheries in which enforcement costs have initially risen after conversion to ITQ management, quotaholders have willingly assumed the added enforcement costs. As argued earlier in this testimony, the Magnuson Act should be amended to allow U.S. fishery managers to require ITQ quotaholders to pay enforcement costs.

The economic and social costs of ITQs and of any other management tool that reduces overcapitalization and fishing effort include, most notably, reducing the number of fishers actively fishing. The choice of leaving overcapitalization unaddressed is no choice at all, however, and will have an even more catastrophic effect on jobs. For, under conventional open access management, and even under limited access management that imposes no limit on the percentage of the TAC that an individual fisher may take, continuing technological innovation and available capital make each fisher increasingly powerful, further escalating the race for fish. The inevitable result is overfishing, fish population collapse and fisher job loss.

ITQs, unlike other approaches, would compensate those fishers who want to get out of the fishery. Moreover, ITQs will bring stability to the jobs that <u>are</u> saved and, because ITQs help fish populations to recover, or to recover more rapidly than they might under other management approaches, ITQs may in fact lengthen job terms, as TACs are increased and boats can spend more days fishing. They may even ultimately increase the number of jobs as boats increase crew sizes to handle increasing TACs, as populations recover.

ITQs may also change the character of a fishing community, if individual quota-holders decide to sell out to larger firms. There are a number of ways to design ITQ programs to prevent such an outcome, however. These include: establishing quota percentage ownership caps, setting aside quota for recreational fishers, issuing some quota to communities and restricting quota share trading in various ways. Unfortunately these kinds of restrictions will diminish the principal benefits of ITQ-based management -- its tendency to reduce fishing effort and increase fisher efficiency while increasing fisher profitability and, therefore, its

tendency to provide economic incentives to quotaholders to be better long term ecosystem stewards.

Fishery managers considering adopting such restrictions during ITQ program design must strike a balance between competing desires to "engineer" specific social outcomes and to maximize conservation benefits, taking into account the characters of the specific fishery and affected fishing communities. It should also be remembered that quotaholders, including individuals and communities, can help prevent quota consolidation simply by choosing not to sell quota -- like hardscrabble family farmers choosing to continue farming rather than "cashing out" by selling their land to developers or to corporate farming enterprises -- and instead making a long-term commitment to the health of their fishery.

This last analogy, comparing quota ownership to land ownership, raises another set of concerns that critics of ITQs have frequently expressed -- the fears that issuing ITQs to fishers would either run afoul of the public trust doctrine or, perhaps worse, create the nightmarish potential for expensive Fifth Amendment takings claims whenever fishery managers decide to reduce TAC in the face of dwindling fish populations, or to dismantle an ITQ program if it isn't working.

The answers to these legal concerns are clear, however. Quota ownership is fundamentally different from land ownership. If some basic principles are observed during ITQ program design, issuing ITQs will <u>not</u> create property rights that could trigger valid takings claims under the U.S. Constitution. And their issuance will not violate the public trust doctrine.

The most basic principle to observe in ITQ program design is to provide full disclosure to quotaholders of the risks of quota ownership. Express ITQs as a percentage of a variable TAC and leave it up to the fishery managers to decrease or increase the TAC from season to season, or even to reduce it to zero, depending upon the condition of the fish population and its larger ecosystem at the beginning of each season. Other ITQ program designers, notably in New Zealand, have made the mistake of defining ITQs as an absolute amount of fish the quotaholder may catch during a season, rather than as a percentage of a variable TAC. These mistakes led to expensive government programs to buy back quota when fishery managers realized they had overestimated the sizes of fish populations and needed to reduce the TAC.

Fears that ITQ-based management may violate the public trust doctrine are equally unfounded. A properly designed ITQ program expresses ITQs not as the conveyance of property interests in a public resource -- wild fish -- but simply as harvest privileges allowing each quotaholder to engage in fishing activities. A quotaholder may continue fishing during a season until having caught a percentage (equal to his or her percentage quota share) of the TAC previously established for that season.

In conclusion, in addition to amending the Magnuson Act as we have proposed earlier in this testimony, EDF recommends that Congress take two specific actions to address ITQs. First, impose a temporary moratorium, one year initially, on the initiation of new ITQ programs in U.S. managed fisheries. Second, establish a carefully designed ITQ pilot study.

These steps would allow fishery managers to learn from closely monitored experience with a limited number of new ITQ experiments, as well as with those few that are ongoing, before the use of ITQs in the U.S. is allowed to expand further. We suggest that Congress immediately convene an expert panel, such as the team that produced the National ITQ Study Report, to establish the factors that should be considered in selecting fisheries for ITQ management, and in designing ITQ programs, so that conservation benefits are maximized.

EDF's draft report on ITQs includes specific proposals for such selection considerations and design criteria and other authors have made similar proposals, all of which could help inform the panel's effort. The panel should adopt preliminary guidelines as soon as possible and revise them periodically as more is learned from the ITQ pilot study. The guidelines would be used to establish pilot ITQ programs in several US fisheries. The panel would evaluate the pilot study and the moratorium annually to decide whether to recommend to the Secretary of Commerce extending the moratorium, lifting it, or modifying it.

ITQs are the most promising fishery management tool on the horizon. They will only be effective, however, within a framework that includes mandatory ecologically-based TACs, aggressive fish population rebuilding targets, tough enforcement, collection of solid data on which management tools work and which don't, new protection for marine habitat, and continuing use of conventional tools like restrictions on non-selective and destructive gear.

Thank you for the opportunity to present testimony on this important subject.

United Catcher Boats

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United Catcher Boats was founded in December of 1993 through the efforts of several leaders in the commercial fishing industry to unify the owners of vessels which trawl for Alaska groundfish and West Coast whiting. Many of these vessels also have a long history of fishing Bering Sea crab in addition to their groundfish trawl fisheries.

United Catcher Boats is a successor organization to both American High Seas Fisheries Association and American Independent Fishermens Association and, in addition, is now home for many vessels not previously belonging to any association of vessel owners.

Presently 53 vessels are on the membership roster (see attached) and the list is still growing. This fleet now accounts for at least 85% of all Bering Sea, Aleutian Islands and Western Gulf of Alaska pollock and Pacific cod catches harvested by vessels that catch but do not process aboard. The magnitude of this groundfish harvest alone totals 675,750 mt, conservatively valued at $150 million to the fishermen.

We are very enthusiastic about the formation of United Catcher Boats and the prospects of bringing this impressive fleet together in support of rational fisheries management, sustained yields, reduced bycatches, and maintaining our vessels' market share in this competitive industry.

Vessels comprising the membership are modern, high-tech, stern-ramp trawlers in the 85'-180' range. They are American built and maintained, primarily family owned, American crewed, financed by local banks and support their local community infrastructures. Most vessels are home ported

in Washington State, but others stem from Northern California, Oregon and Alaska.

The United Catcher Boat office in Seattle is served by President John Gruver, a veteran captain and partner/owner of the F/V *Seawolf*, Vice President Frank Steuart, a veteran businessman in the fishing industry and owner of the F/V *Sunset Bay* and *Half Moon Bay*, Secretary Robert Czeisler, Treasurer Margaret Hall, and an impressive 14-member board of directors. Steve Hughes, a well-known and respected fishery biologist with 25 years' experience in North Pacific fisheries, serves as United Catcher Boats' Technical Director. Brent Paine, former senior staff biologist with the North Pacific Fishery Management Council, is United Catcher Boats' Executive Director.

We appreciate the opportunity to make this introduction of our new association. Please stop by for a visit or give us a call.

United Catcher Boats
Membership List
February 4, 1994

	Vessel Name	Owner
1	Alaskan Star	Supreme Alaska
2	Aleutian Challenger	Breskovich
3	Alsea	Hall/Gerding
4	Amber Dawn	Parker
5	American Beauty	Flemming
6	American Eagle	Hjelle/Tynes/Wabey
7	Argosy	Hall
8	Auriga	Henricks/Atterberry
9	Aurora	Henricks/Atterberry
10	California Horizon	Reilly
11	Caravelle	Westman
12	Catlin Ann	Dooley/Dooley
13	Chelsea K	Garrison
14	Destination	Austneberg
15	Doña Liliana	Desautel/Kuhr
16	Doña Paulita	Desautel/Kuhr
17	Flying Cloud	McManus
18	Golden Dawn	Barets/Sarich
19	Great Pacific	Bronson
20	Gun-Mar	Ildhuso/Ildhuso
21	Half Moon Bay	Steuart
22	Hazel Lorraine I	Dooley/Dooley
23	Mar-Gun	Ildhuso/Ildhuso
24	Margaret Lyn	Czeisler
25	Mark I	Pedersen/Pedersen
26	Miss Leona	Westman
27	Morning Star	Stanchfield
28	Muir Milach	Fraser
29	Neahkahnie	Bohannon
30	Nordic Fury	Hovik/Stone
31	Nordic Star	Swasand
32	Ocean Leader	Flemming
33	Oceanic	Langesater
34	Pacific Alliance	Supreme Alaska
35	Pacific Challenger	Peterson
36	Pacific Fury	Hovik/Stone
37	Pacific Prince	Dooley/Dooley
38	Pacific Viking	McManus
39	Progress	Hall/Robinson

United Catcher Boats
Membership List
February 4, 1994

40	Rosella	Westman
41	Royal American	Austneberg
42	Seawolf	Watson/Gruver
43	Sharon Lorraine	Dooley/Dooley
44	Starfish	Swasand
45	Starlite	Swasand
46	Starward	Swasand
47	Sunset Bay	Steuart
48	Tracy Anne	Fraser
49	Vanguard	Hall/Hall
50	Vesteraalen	Pedersen/Cosgrove
51	Viking	Reilly
52	Western Dawn	Olsen
53	Westward I	Reilly

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February 1, 1994

The Honorable Thomas Manton
Chairman, Subcommittee on Fisheries Management
U.S. House of Representatives
Room 1334, Longworth Office Building
Washington, DC 20515

Dear Rep. Manton,

In anticipation of the Fisheries Management Subcommittee's February 9th hearing on the use of Individual Transferable Quotas as tools for fishery management and conservation, I am enclosing a copy of an issue paper recently published by the National Coalition for Marine Conservation. It is entitled, "The Crowded Sea: An Issue Paper on Limiting Entry to Marine Fisheries."

The National Coalition for Marine Conservation has been actively promoting policies to improve the stewardship of marine fisheries since 1973. Our overriding interest in considering limited entry in its various forms, including ITQs, is resource conservation. In our paper, we urge a reasoned and deliberate approach in planning the application and implementation of limited entry schemes, suggest some basic principles to guide the use of limited entry as a management tool and enhance its potential for success, and conclude with recommendations for legal and policy changes at the federal level.

We would be happy to talk further with you or the subcommittee about how limiting entry to marine fisheries can and should fit in to our national fisheries policy.

Thank you for your consideration of our views.

Sincerely,

Ken Hinman
Executive Director

Enclosure

THE CROWDED SEA

AN ISSUE PAPER ON LIMITING ENTRY TO MARINE FISHERIES

by Ken Hinman and Carl Paulsen
National Coalition for Marine Conservation
Savannah, Georgia

November 1993

SUMMARY

Historic open access policies have led to overcrowding and overcapitalization in many U.S. ocean fisheries. This condition contributes to and/or exacerbates overfishing, bycatch, waste, user conflicts, high management costs and economic inefficiency. In response, limited entry as a control on fishing effort is being considered in a growing number of U.S. commercial fisheries. In some cases, this means not merely restricting, but substantially reducing the total number of participants in a given fishery.

By virtue of limiting entry into a fishery, the government bestows an exclusive right to harvest a share of a public resource, whether or not individual shares or vessel quotas are assigned. In theory, participants will thus have a greater incentive - a proprietary interest, if you will - to support and comply with measures to conserve fish populations for the long term. These concepts - limited entry and the rights-based fishing it confers - represent a radical departure from prevailing practice.

It is our conclusion that limited entry is not a panacea for fisheries management problems, but rather can help supplement more traditional regulatory measures. Nor are limited entry systems suitable for all fisheries. Whether or not they are a preferred option, and what type of system is appropriate, must be determined on a fishery-by-fishery basis, according to local needs and conditions.

In our view, limited entry, if properly implemented, offers the potential to alleviate a wide range of management problems, including overfishing. Likewise, there are potential pitfalls if all the ramifications of privatizing publicly-owned resources are not fully considered. Above all, any limited entry program should contain, as a principal feature, a demonstrable conservation benefit.

While urging a reasoned and deliberate pace in planning the application and implementation of limited entry schemes, we suggest some basic principles to guide the use of limited entry as a management tool and enhance its potential for success, and conclude with recommendations for legal and policy changes at the federal level.

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I. INTRODUCTION

For the purposes of this paper, limiting entry to marine fisheries means directly restricting the number of fishermen and/or fishing vessels permitted to participate in a particular fishery.

Limited entry is a reversal of the traditional practice of allowing citizens free and open access to publicly-owned fish populations for private exploitation. Limited entry is, by most measures, a fundamental - some would say radical - departure from the *status quo* in the management of living marine resources in the United States.

Putting limits on access to marine fish populations is not new, of course, and can take many forms: for example, fishing within established quotas; restrictions on the use of certain types of fishing gear or the capture of certain species; and time-area closures, where designated coastal waters, such as spawning grounds, are placed off limits during specific periods. These are all forms of controlling public access in order to advance fishery management goals.

Limiting entry may provide an important new tool for conserving and managing some marine fisheries.

What is commonly referred to as limited entry, however, is controlled access in its most severe form; designating a finite number of individuals, or fishing vessels, permitted to operate in a given fishery. And because it is, in many cases, a response to overcrowding, limited entry often means actually *reducing* the number of fishermen* allowed to fish, either directly or through some form of incentives or disincentives.

Limited entry is a heretofore little used and highly controversial management strategy in the U.S. It is still a pariah among many American fishermen, who feel controlling the number of people allowed to fish revokes their traditional rights and inhibits their historic fishing patterns. Even so, an increasing number of fishermen, along with fishery managers and members of the conservation community, recognize that limiting total participation may provide an important new tool for conserving and managing some marine fisheries, a tool that's now missing from the usual bag of regulatory strategies.

Because of mounting interest in limited entry as a legitimate management option - to the point where it is currently being actively promoted in a number of major U.S. fisheries - fishery policy makers, fishermen, conservationists and others would do well to pause and take a critical look at limited entry; in terms of how it might help resolve some of the problems plaguing our ocean fisheries and contribute to the rational use of marine resources for the benefit of all Americans.

In doing so, we should acknowledge upfront that limited entry is not an answer for all the nation's fisheries ills. Indeed, there is a downside, and we must carefully examine it and understand it. In particular, limited entry, by virtue of allocating to certain citizens an exclusive right to fish, raises concerns about the implications and ramifications of awarding private citizens a form of "ownership" of publicly-owned natural resources.

The purpose of this issue paper, prepared for the National Coalition for Marine Conservation with funding from the David and Lucile Packard Foundation, is to consider the need for limiting entry to marine fisheries, discuss those management problems limited entry might address, and define and assess its potential - advantages and disadvantages - as a means for advancing the nation's fishery conservation and management goals.

The National Coalition for Marine Conservation's overriding interest in considering limited entry is conservation, not social or economic engineering. Moreover, this paper neither endorses nor does it reject specific limited entry programs, of which there are a

* Numbers of fishermen will, in most instances, also refer to numbers of fishing units, i.e., vessels, traps, nets, etc.

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variety. Rather, it is our sincere hope that the following discussion and analysis will contribute to the ongoing dialogue about how limiting entry to marine fisheries can and should fit in to our national fisheries policy.

II. THE WRITING IS ON THE WALL

Limited entry is an issue fast rising to the top of the national fisheries agenda. It is possible, even likely, that during the next decade the complexion of U.S. fisheries will change dramatically, from policies allowing generally unrestricted participation to some form of direct controls on the absolute numbers of fishermen allowed to fish in many, if not most, of our commercial fisheries.

The handwriting is already on the wall. Where in the past limited entry was discouraged as a management tool, it is now openly and actively encouraged. The National Marine Fisheries Service (NMFS), an agency of the U.S. Commerce Department, advocates "conversion from open access fisheries to controlled access," citing how the "race for the fish" that characterizes open access fisheries causes economic inefficiency, which in turn creates and/or reinforces pressure to overfish (NMFS 1991).

The agency has informed the Regional Fishery Management Councils, responsible for preparing fishery management plans for U.S. marine fisheries under the Magnuson Fishery Conservation and Management Act, that the door is open for approval of limited entry as a major feature of these plans. NMFS even commissioned a national study of individual transferable quotas - ITQs assign certain fishermen the privilege of catching a specified quota - to assist the Councils in considering this management option.

In fact, ITQs, pioneered in New Zealand, Canada and several other countries, are already being used to manage Atlantic surf clams and wreckfish in the U.S. The total number of fishing permits are restricted in fisheries for spiny lobster on the east coast and sea urchins on the west coast. Limited entry plans based on quota-shares, either ITQs or similar individual fishing quota set ups, are under consideration for a number of other fisheries, including but not limited to Pacific halibut and sablefish, red snapper, shrimp, swordfish, grouper, Spanish mackerel and sharks.

Support for limiting entry is coming from outside the federal management system, too. The North American Fisheries Leadership Workshop, a 1991 assemblage of state and federal fisheries administrators from all over the continent sponsored by the American Fisheries Society, recommended exploring and implementing "innovative" access control programs in emerging and existing fisheries (Harville 1991).

In the past, limited entry was discouraged as a management tool. Now it is openly and actively encouraged.

The environmental community, a relative newcomer to marine fisheries issues but one representing the growing interest among the broader, non-user oriented segment of the American public, is also exploring the potential of limited access for achieving conservation goals. The World Wildlife Fund and Center for Marine Conservation, for example, jointly sponsored a two-day conference in September 1992 solely devoted to that topic.

Finally, and perhaps most significantly, a growing number within the commercial fishing industry, long a mighty fortress of opposition to the notion of government deciding who can and cannot fish, are now giving limited entry a fresh look. The growing perception within the industry is that allowing free and open access is failing both the fish resources and the fisheries they support, as evidenced by sharply declining catches in several of the country's most valuable fisheries, declines that are occurring in spite of - or maybe we should say because of - an unprecedented rise in fishing effort.

"You can't conserve stocks in a free-for-all," concludes Richard Allen, a commercial

fisherman and member of the New England Fishery Management Council who was himself once a staunch foe of limited entry. That sentiment is being echoed across the country.

III. WHAT'S WRONG WITH THIS PICTURE?

Prior to 1976, waters off the U.S. coastline were truly open access, open to foreign as well as domestic fishermen. But over-exploitation by visiting foreign fleets triggered a shift in policy, restricting foreign fishing near our shores. In 1976, the U.S. Congress enacted the Magnuson Act to "promote [domestic] commercial and recreational fishing" within a 200-mile fishery conservation zone "under sound conservation and management principles."

In the years following passage of the new law, the U.S. fishing fleet grew substantially, by 40% in numbers of boats and 60% in numbers of fishermen. At first this expansion, replacing displaced foreign vessels within our zone and exploiting under-utilized species, produced a substantial rise in domestic fish catches. But beginning in the 1980s, the correlation between increased fishing effort and higher catches broke down. Although effort continued to rise - both in terms of the numbers of active vessels and the fishing capacity per vessel, thanks to the development and use of more sophisticated gear and fish-finding technologies - catches peaked and, in most major fisheries, fell into a decline.

Fishermen are expending an increasing amount of effort to catch a decreasing amount of fish.

Today, 67 species or stocks of fish found off the U.S. coastline are overutilized, many severely, according to the most recent government studies. That amounts to 43% of those stocks whose condition is known. Overall, our marine fisheries are overfished and under-producing. The long-term potential yield of U.S. fisheries is estimated to be 7.7 million tons a year, about 50% higher than recent average yields (NMFS 1992).

NMFS estimates that overfishing and over-capitalization - that is, more fishing capacity than is needed to catch the available, or surplus, fish - are depriving the U.S. commercial fishing industry of approximately $3 billion a year in economic benefits. The economic impact of lost recreational opportunities is unquantified but thought to be equally substantial. Less well known, but potentially more damaging from both a biological and economic perspective, are the long-term effects of overfishing and stock depletion on the stability of ocean ecosystems.

Generally speaking, the amount of fishing effort being expended in U.S. fisheries far exceeds the amount needed to catch what the resources are capable of producing on a continuing basis. In other words, an increasing amount of fishing effort is being exerted to land a decreasing amount of fish.

One of the most dramatic examples is that of New England groundfish, among the nation's oldest and most valued fisheries. Unchecked expansion of the U.S. trawl fleet beginning shortly after passage of the Magnuson Act eventually drove cod, haddock and flounder populations down to all-time lows. Today, with too many fishermen chasing too few fish, the industry is in dire financial straits.

The cost to the nation in lost economic benefits is staggering. If the groundfish stocks were restored and fishing effort brought into balance with the capacity of the resource to sustain it, the fishery could produce $350 million more in gross income annually and 14,000 additional jobs (Sissenwine and Rosenberg 1993). If this isn't done, warns Richard Roe, northeast director of NMFS, "the New England groundfishery, like the New England textile industry, may become history" (Roe 1993).

Or consider also the southern shrimp trawl fishery, another of the nation's most valuable.

The number of boats and amount of effort in the Gulf of Mexico shrimp fishery tripled between 1960 and the late 1980s, to where today there are an estimated 15,000 active trawlers. Yet during this period of growth, catches decreased by 300 pounds per vessel ton. In the south Atlantic region, shrimping effort has also risen dramatically. Around 1930, there were fewer than 650 boats catching 30 million pounds of shrimp. By 1989, the number of fishing permits had increased to 5,300, yet catches remained at or below 30 million pounds (SAFMC 1993).

The Atlantic harpoon fishery, to cite yet another example, caught 7.2 million pounds of swordfish in 1959. That total is more than the recent (1992) U.S. catch. In other words, fishermen using harpoons landed more fish than today's modern longline fleet of well over a hundred vessels employing 30-mile sets with more than 500 hooks per set. What's more, the harpooners' average size fish was over 200 pounds in 1959, compared with about 60 pounds today. They operated in a relatively small area for several months, while the longliners work year-round, from the Flemish Cap in the North Atlantic to the waters off Brazil.

The story - increasing effort and declining catches - is the same worldwide. According to the United Nations Food and Agriculture Organization, declining landings are being taken at a much higher cost to the world's fishermen. The annual operating cost of global fishing in 1989 was about $22 billion greater than revenues (FAO 1992). The red ink is, in most instances, offset by government subsidies.

IV. THE TRAGEDY OF THE OCEANS

There are numerous examples of uncontrolled growth in fishing fleets until the catching capacity far exceeds the sustainable yield," confirm NMFS senior scientist Michael Sissenwine and Andrew Rosenberg, scientific editor of the agency's annual status report on U.S. fisheries. "A fleet will continue to grow until there is no longer an economic incentive for other vessels to join it. At this point, proposals to reduce catch (to conserve the fishery resource) are met with strong opposition, because most vessel owners cannot survive even a short-term catch reduction" (Sissenwine and Rosenberg 1993).

This cycle of open access leading to overcapacity leading to overfishing, repeated again and again in fishery after fishery, precisely describes the well-known "tragedy of the commons," popularized by Garret Hardin in his famous 1968 essayof the same name.

The tragedy is that, in the unfettered use of the ocean and other common property resources, what is in the best interests of the individual is not necessarily in the best interest of the resource or of the community as a whole. Individual fishermen, even when confronted with an overall decline in fish populations, have no short-term incentive to conserve - that is, voluntarily constrain their own fishing effort. Each fisherman believes, and with good reason, that what he or she doesn't catch, someone else probably will. Hence, open access fisheries often deteriorate into a race for the fish, or what is often characterized as derby fishing.

In the frantic race for fish, conservation takes a backseat to immediate financial concerns.

The commons problem was actually first applied to fisheries in a 1954 article by Scott Gordon. Gordon argued that "(c)ommon property resources are free goods to individuals and scarce goods to society." Under freedom of access, he warned, unregulated fishing effort increases until fishing becomes unprofitable and resources are overexploited (Gordon 1954).

In most developed fisheries there is some regulation of fishing activities - quotas by species, size limits, gear restrictions, seasonal closures and so forth. But in very few fisheries are there any direct controls on the number of participants or the total amount of fishing

capacity permitted. Without such controls, managers must devise rules to limit fishing effort by making fishermen less efficient. So instead of an appropriate number of fishing vessels working at full capacity, there are an excessive number of boats regulated in a way that ensures they operate inefficiently.

The most drastic example of an overcrowded, open access fishery is North Pacific halibut. With on average 4,000 vessels competing for the annual quota, the fishery consists of just two 24-hour "seasons" during which fishing resembles a feeding frenzy. According to biologists, the fleet is twenty times bigger than is needed to catch the available resource. This Alaskan free-for-all is not only grossly inefficient, but results in an enormous amount of waste, as damaged fishing nets and lower value fish are tossed away at sea in the frantic race to catch as many fish as possible in the limited time allowed (NPFMC 1992). Tragically, the lives of seven fishermen were lost last year in the halibut free-for-all.

Open access does not in and of itself cause overfishing. But it does create pressures to overfish that traditional management methods have failed to control.

Overcapitalized and overexploited fisheries operate at an economic loss, with each fisherman getting a smaller piece of a shrinking pie. Conservation and other concerns take a backseat to immediate financial ones, such as paying boat mortgages and other bills. With few alternatives, marginal fishermen keep fishing, trying to increase or at least maintain catches, with little regard for the long-term impact on the resource or the long-term viability of the fishery it supports.

Managing fisheries for their long-term sustainability requires a careful balance between catches now and maintaining healthy and productive resources for the future. A free and open fishery, however, offers few incentives for individual restraint and puts the emphasis squarely on maximizing present catch. In turn, the pressure on competing fishermen to land as many fish as possible, as quickly as possible, is translated into pressure from the fishing industry on managers to keep total allowable catch levels as high as possible in order to accommodate the excess of users.

V. OPEN ACCESS AND OVERFISHING

From a strictly resource conservation perspective, the real problem is not that there are too many fishermen *per se*, but that they are catching too many fish. Open access does not, in and of itself, cause overfishing. It does, however, create pressures to overfish, in ways that traditional management has difficulty controlling.

Fishermen have a narrow range of incentives within which to act, most of them financial. When fishing is profitable, fishermen invest in gear and technology to give them greater catch capacity. Others enter the fishery, adding even more fishing power. Inevitably, catches will at some point cease to increase incrementally with the addition of fishing effort, then do not increase at all, and finally start to decline.

If prices rise as the fish become scarce, as often happens, this pattern will continue, with perhaps even more fishermen joining the fishery to take advantage of the high prices. If prices do not increase to offset declining landings, fishermen will strive to increase their catch by intensifying their fishing effort or seeking to remove restrictive regulations.

Ironically, the nature of open access fisheries - touted by some as a pure manifestation of free market competition - is such that free market incentives do not cause individual fishermen to voluntarily depart from a fishery when they determine their individual catch is not worth the economic and social costs they accrue and that greater return might be obtained elsewhere (as would happen in most other sectors of the economy). Most fishermen fish because there

When a fishery is overcrowded with too many participants, the pressures to keep catches high can be insurmountable.

is nothing else they'd rather do. They will remain in the fishery, or if not, move to another one.

As fish populations are depleted by overfishing, measures to rebuild the fishery will be proposed. Such measures invariably will impose increased costs to fishermen in the short-term. Fishermen will resist regulations designed to prevent overfishing or rebuild a depleted stock in whatever ways they can.

In New England, for example, groundfish fishermen have successfully fought direct catch limits despite years of overfishing which has led to the fishery's collapse. They have agreed to indirect controls on catches - ones that are readily ignored or evaded - but the fishermen have routinely rejected all meaningful attempts to reduce fishing effort. Similarly, the southern shrimp fishery has become increasingly marginal and at the same time increasingly vocal against measures to control the bycatch of sea turtles and finfish. The industry has so far successfully fought off regulation of finfish bycatch, despite its devastating impact on other fisheries, most notably red snapper.

From a conservation standpoint, resistance to regulation is probably the most crucial consideration in the open access vs. limited entry debate. Under our present management system, decision makers are under constant pressure to prove that proposed regulations will benefit all those currently fishing. This is difficult because "the costs and benefits of conservation measures are not coincident" (Wilson and Gates 1976). Fishermen frequently oppose conservation measures simply because they cannot be ensured of receiving the benefits of their sacrifice.

By definition, conservation equals addition by subtraction, that is, fishermen must give up something today in order to get back something tomorrow. But as long as fishermen view conservation as a short-term economic loss with no guarantee they will personally reap a future benefit, they will try and circumvent existing conservation measures and resist the implementation of new ones.

There are numerous examples of catch levels being set too high precisely because managers are under pressure from fishermen to allow them to maximize their catch for short-term economic reasons. When a fishery is overcrowded with too many participants, each just scratching out a living, the pressures to keep catches high can be insurmountable.

When the number of participants so drastically exceeds what's needed to catch the sustainable yield, the fishery gets out of hand and managers lose their ability to control fishing mortality, even when a fishery is managed under a quota, or total allowable catch limit. As already pointed out, competition within an overcrowded fishery degenerates into a fishing derby. In this free-for-all environment, such concerns as bycatch of non-target or prohibited species, discard of low value catches (known as "high-grading") and waste are secondary at best. At worst, they are of no concern at all.

In the race for fish, there is little regard for bycatch, discards or waste.

Under conventional (open access) management schemes, competition for a scarce resource can be intense. In this atmosphere, worrying about bycatch, discards and waste costs fishermen time and time is money. In short, the race for fish eliminates the luxury of a conservation ethic.

In addition, the hectic race to catch fish before the fishery is shut down enhances the likelihood the quota will be exceeded. If a fishery is too diffuse, there will be unreported catches and frequent quota over-runs.

Extrapolations of catch data from small at-sea or dockside samples are inaccurate, and self-reporting systems are unreliable. Closures, therefore, are initiated based on rough estimates of the total catch at a given point in time.

Without direct limits on fishing capacity, some attempts to reduce fishing effort can actually result in increased mortality. For example, if managers reduce the length of a fishing season, fishermen will fish harder while allowed, setting more hooks or traps or laying larger nets. In such cases, observes Lee Anderson, economist and member of the Mid-Atlantic Fishery Management Council, management becomes a game played between managers and fishermen, where fishermen always have the last move. If there is a legal way to circumvent the intent of the regulations, they will find it.

Regulating fishermen without limiting entry can prevent overfishing - in theory, if rarely in practice. Gear and area restrictions, days-at-sea limits and other traditional management tools aimed at controlling access to fish populations all have the potential to stop overfishing and rebuild depleted stocks. Unfortunately, managers operate under political constraints; they often lack the political fortitude necessary to establish a biologically sound program and ensure its enforcement.

Nonetheless, in fisheries where existing regulations have successfully prevented overfishing, markets and the industry can be left to determine the appropriate fleet size. Individuals can keep fishing as long as the profits and wages are acceptable, without managers establishing the level of fishing effort. In these cases, there is no need for limited entry. Should these controls begin to fail, however, limited entry may need to be considered.

VI. THE POTENTIAL BENEFITS OF CROWD CONTROL

It is axiomatic among military experts that we fight each war with the weapons of the next war and the strategies of the last. In a similar way, fishermen and fishing technology outpace the ability of managers to control them through traditional regulatory strategies.

Without controlling the size of the fishing armada that occupies the seas off our shores, we've had little choice but to disarm the fishermen; that is, regulate their activities in such a way as to make each fisherman as inefficient as possible. The logical endpoint of this indirect approach would be allotting fishermen one hook and line or harpoon or cast net apiece.

Let's be clear. Limiting the number of fishermen or fishing vessels alone will not reduce fishing mortality. But it can make it easier for managers to design and implement regulations that will. Limited entry is just one more tool among many for managing fisheries. Limited entry is not meant to, nor should it, supplant other controls. What it can and should do is supplement them.

The goal of fishery management is to bring fishing effort and fishing mortality into line with what the resource can sustain on a continuing basis. There are three basic methods of achieving this balance: 1) limiting the quantity of fish landed (quotas, size limits); 2) limiting the efficiency of fishing practices (gear regulations, trip limits); and 3) limiting the total fishing capacity (limited entry). With few exceptions, managers have heretofore dealt almost exclusively with the first two of these options. In expanding and overcrowded fisheries, effective management must address all three.

To make sacrifices, fishermen want to feel confident they will have a fair chance of reaping the benefits.

With resource conservation as our primary objective, there are a number of potential benefits to be realized by limiting entry to marine fisheries. (The potential problems with limited entry are discussed in the next section.)

• An Incentive to Conserve

Without some form of exclusive use rights (license limitations, quota shares, etc.), fishermen tend to view conservation as a trade-off between present and future catches. By giving fishermen a long-term stake in a fishery, limited entry can alter their attitude toward conservation, and provide them with both an economic and a moral incentive to conserve (Fullilove 1993).

Ideally the right to fish should be based on a pact between fishermen and managers, an agreement to fish in certain ways and to accept certain restrictions as necessary to achieve conservation goals, in return for the privilege of exploiting a public resource for private gain.

Vesting fishermen with a tangible share of the resource provides them with a measure of insurance that they will reap the benefits of their own sacrifice, in the form of reduced catches now in return for increased catches from a healthier stock later on. An analogous situation might be the farmer's recognition that soil conservation is in his or her own (long-term) best interest.

In addition, if those active in a fishery are more stable economically, and there is an incentive to conserve based on anticipated returns, then we should expect less political pressure to subvert conservation goals than exists under an open access system. Fishermen will be more willing to ride out leaner times if they feel they will be the recipients of stock restoration efforts. Fishermen may support conservation measures as beneficial to them if they realize that their sacrifice will not be undone by an increase in effort by their competitors.

(The ability of limited entry to offer a conservation incentive will depend to a large extent on whether future gains can be assured. As such, fishermen will need to feel reasonably certain that they will retain exclusive privileges in the uncertain future. See related discussions in Section VII, Caveats and Potential Problems, and Appendix 2, Private Property at Sea.)

• More Efficient Management

Although achieving economic efficiency motivates many proponents of limited entry, management efficiency - i.e., the effective maintainance of healthy fish populations for the benefit of the nation at minimal cost to the taxpayer - is in the greater public interest.

Limiting numbers of fishermen in overcrowded fisheries can create a more manageable group of fishermen. Generally, limited entry can reduce the margin of error in fisheries management by more finely tuning the capacity of the fishing fleet to the amount of harvestable resource. Management may become less manpower-intensive as monitoring catch and effort becomes easier, as does law enforcement. (See related discussion in Section VII.)

With a defined set of fishermen and a defined catch, managers can rely more on dockside vs. at-sea enforcement of conservation measures. Indirect controls on fishing effort, such as minimum mesh sizes in trawl nets, must be enforced on the water. But at-sea regulations are notoriously difficult and expensive to enforce.

With exclusive use rights, fishermen have, in addition to an incentive to conserve, an incentive to obey the rules and report those who don't. To the extent that some measure of self-policing occurs, it would enhance at-sea enforcement of restrictions on bycatch and discards, illegal transfer of catches to other vessels, and so on.

• Minimize Bycatch

In some fisheries with bycatch problems (the inadvertent capture of non-target or prohibited species) the handling of the bycatch can make the difference between a fish returned to the water alive or discarded dead. In this case, dead discards are a product of carelessness and haste. To the extent that limited entry fisheries minimize, and in some cases remove, the need to race for the fish, bycatch mortality will be reduced. (See also bycatch discussion in Section VII.)

High mortality of bycatch species is a serious resource problem in many fisheries, but it is also an economic problem. More selective

methods of fishing may not be economic, or perceived by fishermen to be economic, in the short run. But with the pressure of free-for-all competition removed, that is, if fishermen are assured of having an opportunity to land their portion of the total catch at their own pace, then they should be more amenable to accepting regulations designed to reduce bycatch, or to experiment with innovative gear technologies.

In some fisheries, most notably the southern shrimp trawl fleet, the level of bycatch appears to correspond directly with effort. The shrimp population yields a fairly static amount of catch each year, and when effort is increased, it is not matched by a proportionate increase in landings. Bycatch of finfish, on the other hand, which may outnumber the shrimp catch by ten-to-one, does increase linearly with effort.

The size of the Gulf of Mexico shrimp fleet increased from 5,000 vessels in 1950 to an estimated 15,000 vessels today, with only a slight rise in landings. Because of overcrowding, trawlers regularly drag their small mesh nets in areas less productive in shrimp but equally or more productive in bycatch species. Thus, incremental increases in effort have had a disproportionate impact on bycatch species.

A substantial cutback in fishing effort would have little impact on total harvest. A fleet approximately one-third the current size could harvest the same amount of shrimp (GMFMC 1991). Such a fleet reduction could result in significant bycatch reductions by getting thousands of unnecessary nets out of the water.

Both collecting information on bycatch and crafting measures to reduce it requires a fairly comprehensive onboard observer program. Limited entry can make those programs easier to implement and less costly to administer. It might also facilitate incentive/disincentive programs aimed at promoting the use of selective gear.

- Protect Habitat

The race to fish may also cause environmental degradation, by fishermen leaving lost nets in the water rather than bothering to retrieve them. Again, fishermen feel they can't always take the time to collect gear if it gets snagged and breaks away or has to be cut loose. Even more importantly, though, limited entry could help make fishermen stronger and more active advocates for environmental protection. To the extent it confers an exclusive right to a share of a resource, defuses conflicts with other users, and yields greater financial stability, fishermen will be better able and more willing to direct their energies toward wetlands protection and pollution abatement in order to protect their long-term interests.

VII. CAVEATS AND POTENTIAL PROBLEMS

It is also axiomatic that if something can go wrong, it probably will. No one answer is perfect, no one management system will solve all problems. There are no absolutes in fisheries management - "always" means "sometimes," "never" means "rarely," "will" means "may." Problems exist from the outset, others arise as time passes.

Limited entry is no different. As with all management systems, certain problems will be more pronounced in some fisheries than in others, thereby reinforcing the need to consider each fishery on a case-by-case basis and match the type of management program to individual circumstances. Clearly, there will be cases where limited entry is not appropriate, others where it may be the only realistic solution.

The greatest concern is the effect of making fish the private property of fishermen.

Having said that, there are some key concerns to be examined whenever limited entry is considered as a management option.

- Property Rights

Perhaps the greatest concern and greatest unknown is the effect of vesting fishermen with property rights. Limited entry programs that

do not carefully define property rights may create a situation in which the government's ability to regulate fishing is actually curtailed.

Throughout a wide range of environmental issues, groups representing industry are raising the issue of private property rights as a means to fight regulation. Advocates of a broad interpretation of property rights contend that the government is limited in how far it can regulate the use of private property without compensating the owner for lost opportunities. Restrictive regulations are seen as a "takings," in effect taking away one's property rights.

In fact, many government regulations do restrict the use of property, but few actually "take" property away from the owner. The Supreme Court recently suggested (in Lucas v. South Carolina Coastal Council) that regulation would have to result in the complete loss of the use of the property in question for it to result in a takings. When even a small economic use of the property remains, regulations protecting the public interest may be justified without compensation. Nonetheless, while the jury is still out on exactly whether and when regulations qualify as a takings, the property rights argument has been an effective inhibitor to some environmental regulation.

Effort displaced by limited entry may increase pressure on other resources.

It is unclear just how the takings principle would be applied to fishing rights under limited entry. When the property in question is a *share* of a fishery, a right to harvest a portion of the available fish, the right granted is not over a physical object. Still, fishermen might argue that regulations that reduce their catch (if not their share) deprive them of a reasonable return on their investment.

How fishing rights are viewed in this context will depend [in part] on just how the rights are established. This problem is potentially serious and limited entry programs that establish rights must be carefully crafted to avoid it. At a minimum, the public must retain ultimate authority over how the resource is used. (See Appendix 2, Private Property at Sea, for a further discussion of privatization of fishery resources.)

- Decreased Mobility

Fishermen have always relied on being able to shift from one fishery to another depending on the availability of fish, weather conditions, and a host of other factors. This mobility can to some degree help alleviate fishing pressure on stressed stocks by allowing fishermen alternative targets. By tuning harvests to meet demand and respond to stock fluctuations, fishermen also improve their efficiency.

All forms of limited entry will by definition restrict mobility. The consequences of restricting mobility must be considered and balanced against the benefits of the limited entry program. It may be appropriate to develop and incorporate some mechanism to allow mobility among fisheries under limited entry. Short term transfers of shares, such as leasing, might allow some inter-fishery movement. Such programs, however, will likely increase the burden on enforcement, and may create more problems than they solve.

- Displaced Effort

The effort reduction gained by limiting entry may end up displaced into fisheries without limited entry restrictions. Many of those who choose fishing are wedded to a livelihood on the sea, and are therefore not likely to leave fishing altogether if there is another fishery to enter. Assuming that not all fisheries will limit entry, there will always be a place to go, and the displaced effort will only increase pressure on those other resources. This may in turn compel those fisheries to consider limiting entry, even if it would otherwise be entirely inappropriate.

- Waste

Some critics of limited entry believe high-grading - the discarding of low value fish in favor of higher value fish - would be encouraged by some quota share systems. For instance,

if a vessel has a limited amount of fish to harvest based on its share of the total allowable catch, and if it is guaranteed the right to catch that quantity during the course of the trip or season, there will be an incentive to keep only the most valuable fish to be counted against the quota. High-grading would be most problematic in fisheries where there is a significant price differential (whether size, sex or species related) among the fish in the catch.

Mixed species fisheries pose a special problem in terms of high-grading. If a quota is allocated in terms of allowable catch for each species, either the species whose quota is already reached must be discarded as fishing continues for other species, or fishing must cease as soon as the first species quota is met.

High-grading already occurs in open access fisheries. The extent to which it will undermine conservation objectives under limited entry by increasing discard mortality will depend largely on how effective a quota-share system is in instilling the conservation ethic among fishermen. If they recognize they have a tangible stake in the health of the resource, if they police their own fishery and report violators, if they adopt more selective fishing practices, etc., then high-grading may become less of a problem, not more. In any case, limited entry programs should outlaw high-grading and enforce against it to the greatest extent possible.

- Bycatch

While limited entry programs could facilitate efforts to control bycatch (see Section VI), they may also create new problems. When there is limited entry in one fishery and the same species is taken as bycatch in another, that bycatch undermines the exclusive nature of the limited entry right. If allowed to be landed, the bycatch allowance will cut into the quotas shared by those in directed fishery. If not, it will merely be discarded. The result is either unhappy share owners in the first instance or waste in the second.

Bycatch problems must be addressed whether or not limited entry is initiated, through fees and incentive programs, regulation of gear and fishing practices. But limited entry makes it all the more critical to resolve them. Where the bycatch problems are insurmountable, those fisheries may not be suitable for limited entry.

- Enforcement Costs

Enforcement is critical for limited entry, as it is with any management program. But research, data collection and monitoring, which are essential to the successful implementation and enforcement of limited entry, are costly. The highest costs will come at the beginning, in designing and implementing a limited entry system. But in the long run, administrative costs, including enforcement and data collection, may decrease (see Section VI). If fees are assessed on the permitted fishermen, this could offset any increased costs incurred as the result of implementing a limited entry system.

Under current law, managers cannot recover the costs of management from fishermen.

VIII. PAYING THE RENT

While the notion of free and open access in fisheries is somewhat misleading (there are costs associated with running a fishing operation), fishermen are not required to pay a fee to harvest fish. Land-based extractive industries, on the other hand, are charged fees for the use of the public's natural resources, although usually not at market rates. Even private landowners are assessed a form of "user fee" through property taxes. Why should fishermen be treated any differently?

The question becomes even more important under limited entry systems that ensure an individual an exclusive right to harvest a resource. That right must come with a set of responsibilities. It's in the public interest to maintain healthy renewable resources even when it is also interested in putting those resources to use. The costs of management should be the responsibility of those who benefit

from the use of the resource.

Programs that establish fishing rights free of charge provide an unfair advantage to the few who receive them. Marketable rights, such as individual transferable quotas, develop value as soon as they are granted. Since they are inherently exclusive, anyone wishing to enter a fishery after fishing rights are established will have to buy into that fishery at market value.

The new fishing rights create wealth that did not previously exist and confer it upon anyone fortunate enough to qualify for them. The government should not be in the business of bestowing windfall profits on individuals from the sale of public property. If marketable rights are to be established, the initial allocation should collect a fee in some market-oriented fashion.

Auctions have been proposed as a means to distribute the initial shares of fishing rights in a manner approximating the market. But an open auction might eliminate some of the historic participants in the fishery from consideration because of the potentially high upfront costs. On the other hand, while it could be argued that historic participants deserve a right of first refusal by dint of helping develop the fishery, restricting sales may make it difficult to get fair market value. Whatever the method used, provisions must be made at the outset for a means to attach a price to marketable rights.

Revenues generated through user fees and permit, license or lease systems attached to privatization should be used to fund a number of critical management-related needs. Among these are: fishery research and data collection, habitat protection, bycatch reduction and enforcement. In addition, a portion of the funds might be used to help minimize the impacts to those pushed out of the fishery or otherwise impacted by limited entry. Such assistance would make limited entry more acceptable to the industry.

Unfortunately, under current law, federal managers cannot recover the costs of management from fishermen. They can only recover costs of administering a license or permit system, and even then that money ends up in the general treasury rather than going to fisheries administration. In order for the public to collect rent on the use of its marine resources, the Magnuson Act will have to be changed to allow the government to charge user fees above permit administration costs. The law should also stipulate that the new revenues be deposited in a dedicated fisheries trust fund, and that these funds supplement, not replace, existing monies.

IX. MANAGEMENT PRINCIPLES FOR LIMITING ENTRY

Limited entry is not a final answer, it is an experiment. But that experiment is much more apt to succeed if certain basic principles are applied. Limited entry programs should:

→ **contain a clearly defined conservation objective.** Fisheries management must first and foremost prevent overfishing, according to National Standard No.1 of the Magnuson Act. Furthermore, according to National Standard No. 4, Fishery Management Plans cannot have economic allocation as their sole purpose. Economic allocation and efficiency must be secondary to the goal of improved conservation. Economics can and should contribute to the discussion, especially in determining the type of limited entry system appropriate for a particular fishery, but these considerations should not be the prime motivating force behind limited entry management.

The limited entry program should spell out the conservation problems it is designed to resolve, outline how the program will resolve them, and how it will monitor progress toward achieving its goals.

→ **start with a solid information base.** A thorough understanding of the fishery is essential to deciding if limited entry is appropriate and designing a suitable program. Before any limited entry program is implemented, there must be an established data collection system, preferably with a lengthy time series of information on the fishery, including socio-

economic as well as biological data. This information is essential for determining who and how many are eligible to participate and on what basis, how much of a share each participant gets, what the capacity of the fishery is, and a host of other issues.

→ **provide for open public involvement in all management decisions.** The public, not the users, must make final fishery management decisions, with those decisions based on sound biological principles, as the Magnuson Act mandates. Current public decision making procedures, such as the open forum provided by the Regional Fishery Management Councils, are essential to ensuring that the public has a voice in those decisions.

→ **carefully define property rights.** Fishing rights should be carefully established, whether under a license limitation or individual quota system, in such a way as to give fishermen a conservation incentive, i.e., they must be reasonably assured of reaping the benefits of their sacrifices. Such rights should be exclusive but not absolute. Managers must be able to restrict fishing operations, including reducing catches as under non-limited entry fisheries, without invoking a takings claim. In short, the public must retain ultimate management authority.

Whether limiting the numbers of vessels or assigning quota shares, a fair and reasonable method for assigning rights must be devised. The program should recognize historic participation in the fishery, and may also account for historic catches. (Appendix 2 contains a further discussion of special requirements and considerations which should apply to limited entry programs that establish property rights.)

→ **feature adequate provisions for enforcement.** Switching to limited entry systems will require a change in the way we enforce regulations. The change will require new and innovative enforcement strategies and technologies. In some cases, a careful paper trail to monitor catches and electronic vessel tracking systems will be needed. Penalties will have to be sufficiently severe (for instance, the loss of fishing privileges) to deter noncompliance. Without these changes, enforcement will be inadequate to protect the resources and the interests of those in the fisheries.

→ **contain complementary regulatory measures.** Entry limitation alone cannot control fishing effort and mortality. Above all else, managers must establish a biologically sound total allowable catch level, or there will be no conservation benefit. Other restrictions, such as gear-based measures, will also be needed in order to control bycatch or reduce fishing mortality on specific age groups.

→ **reduce participation in overcrowded fisheries.** When dealing with an overfished or depleted resource, limited entry, as part of a rebuilding program, should allow for a decrease in the total number of participants, not merely lock in the *status quo*. At the same time, managers should work with industry and coastal communities to anticipate and minimize social and economic disruptions.

→ **be flexible and open to change.** Limited entry programs must be readily modifiable to meet changing conditions and circumstances. We learn from our mistakes and managers must retain the freedom to adjust the rules accordingly. Such adjustments might even include increasing participation in the future if the fishery is able to sustain it, or opting for an entirely different management approach should the existing program fail to achieve its goals.

→ **assign quota-shares as a percent of the fishery.** In fisheries where quota shares are established, these shares should be assigned as a percentage of the total allowable catch of fish, not as a quantity of fish. This allows each individual shareholder's catch to increase or decrease according to the condition of the fishery.

→ **contain protections against concentration of shares.** Individuals and vessels should be limited in the amount of shares they can accumulate. Without some kind of limitation, shares will likely concentrate in the hands of a few, reducing the level of employment in the

fishery and making it difficult for others to enter. As fishing rights concentrate, those with rights gain increased influence over managers and markets. There should be a limit on the percent of the total allowable catch that any one shareholder may accumulate.

In addition, consideration must be given to the entity to which the shares are attached, i.e., the captain, the vessel, a corporate body or some other entity. Corporations may be able to hide the accumulation of shares under elaborate corporate structures, while vessel-based shares allow an individual to amass shares by acquiring vessels. On the other hand, shares tied to captains may not limit the number of vessels and fishing power deployed, which can lead to bycatch and other conservation problems.

→ **allow for non-use of quota shares.** There should be no penalty for not utilizing a quota share. Non-consumptive use must remain an option, even for a commercial shareholder.

→ **be coordinated with fisheries development activities.** We can't have one arm of government promoting fisheries development while the other tries to control overcapitalized fisheries. The government currently has several programs promoting private development, including fisheries development grants, marketing research and export assistance, low interest and/or government-guaranteed loans for vessel construction, training programs, and gear development. These programs encourage entry and increased capacity by directly subsidizing it or reducing financial risk. Fisheries aid programs will conflict with the goals of limited entry, and should be reviewed and adapted to fit these goals.

→ **consider provisions to assist displaced fishermen.** Any significant reduction in fishing effort will create winners and losers. Limited entry plans should distribute the benefits in a fair and reasonable manner. Managers could devise a plan for treating those displaced by a reduced entry system, through a buy-out or some other form of compensation, or job training. Funding to aid displaced fishermen should come from the initial sale of fishing rights and/or user fees.

X. RECOMMENDATIONS

Recognizing the benefits of limiting entry to marine fisheries while acknowledging the legitimate concerns raised by its critics, the authors recommend moving ahead at a slow and deliberate pace in order to enhance its potential for success.

1. **Develop A National Policy.** The Clinton Administration should adopt a National Fisheries Policy addressing the issue of limited entry and privatization of marine resources, to guide implementation of limited entry programs in a thoughtful and careful manner. Among other things, that policy should define property rights such that certain management changes or use restrictions cannot be construed as a "takings." The ultimate rights of ownership of the resource must be retained by the public.

2. **Declare a Moratorium.** Congress and/or the Department of Commerce should impose a temporary moratorium on the implementation of limited entry programs that privatize public resources by conferring property rights until the Administration develops a national policy and appropriate amendments (see below) are added to the Magnuson Act.

3. **Establish A Fee System.** Congress should amend the Magnuson Act to allow the federal government to charge economic rent to pay for fisheries research, data collection, management and enforcement programs. All funds collected under the fee system should be deposited in a dedicated trust fund for marine fisheries enhancement.

4. **End Industry Subsidies.** Government subsidies to fisheries development which contribute to overcapitalization should be eliminated as they conflict with the conservation goals of limited entry programs.

5. **Reduce Conflict of Interest in Management Decisions.** The Magnuson Act should be amended to proscribe citizens who

have a vested economic interest in a fishery from serving as a voting member of the Fishery Management Council regulating that fishery.

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Appendix 1

THE LAST FRONTIER

Open access to marine fisheries is a vestige of the enduring presumption, only recently challenged, that the sea belongs to everyone and no one, that nothing humans do will harm it, and that fishing, whether for food or recreation, is a god-given right.

Marine fish are, in fact, the last common property living resource in the United States to which access is free and open. Although fishing is a consumptive use of a renewable yet finite public resource, it is not treated like other such resources; national forests and federal range lands, for instance. Access to these other national resources is strictly controlled and fees are levied by the government for the privilege.

Fish, unlike most terrestrial wildlife, inhabit "property" that can't be fenced in, and thus are not subject to traditional or accepted modes of establishing property "rights." Of course, with the advent of coastal nations claiming sovereignty over 200-mile zones, wherein domestic fishermen may obtain sole access to coastal fisheries, fences are going up at sea all the same. Even so, ownership of the sea and its resources, unlike ownership of property on land, does not yet extend vertically below established governments to the individual.

Or does it? The fisherman's claim to a free and unlimited right of access to ocean fish stocks is actually a remnant of an archaic system whereby the simple act of using a common property resource - in this case catching fish - establishes the right to that use. Indeed, although we may consider fish common property, they become the private property of the fisherman the moment they are caught. Allowing open access fishing might be described as a "takings" in reverse; private individuals "take" property that belongs to the public without compensation.

Common attitudes toward fish contrast with the way we manage wild animals on land. For one thing, commercial fishing at sea is the last large-scale food producing system based on the hunting process. Hunting on land does not offer corollaries, since market hunting (with few exceptions) is outlawed in the U.S. Migratory animals that respect artificial fences no more than fish do, such as waterfowl, are not subject to market hunting, but are instead reserved for sporting purposes.

By definition, sport hunting (including sport fishing) is an inefficient method of killing. Indeed, its inherent inefficiency may be the more pertinent factor in the relative success and sustainability of so-called "game management" than the fact that it is not a commercial enterprise. Commercial hunting was banned, in large part, because modern man developed the capacity, unchecked by any sporting ethic and motivated by profit, to wipe out entire species of wildlife.

Still, it has only been fairly recent in our history - the last 35 years or so - that fishing technology has advanced to the point where fish populations can be decimated, even driven to commercial, if not biological, extinction. The once popular misconception that the ocean holds an inexhaustible supply of fish is finally giving way to the truth. Attitudes and values are beginning to change, due in part to the mass migration of the populace into the coastal zone, where life is more, if you will, ocean-aware. This growing awareness is reflected in the mainstream environmental movement's recent entry into the marine fisheries arena.

Another characteristic of marine fisheries that has probably retarded public concern for fish conservation is that fish are out of sight, out of mind. It is more difficult to measure fish populations and assess cause and effect in the ocean environment than it is in a terrestrial regime. Counting fish is not like counting deer. The risks of overfishing are not as easy to predict. The unknowns and the uncertainties are more pronounced, which can lead to a lack of concern and which can be, and often is, used as an excuse for doing nothing.

There are cultural attitudes, too, that perpetuate open access policies. If in the public

mind there is a growing recognition that there are too many fishermen now going after a shrinking supply of fish, there is also a counter-perception that fishermen have a right to remain fishermen as long as they choose that way of life. Actually, it's more than that. Society benefits from preserving the fisherman's traditional way of life, the thinking goes, a valuation akin to that of preserving the small family farm.

Preserving traditional ways of life is an important consideration in American culture. Ironically, attempting to preserve the fishing way of life by insisting on laissez-faire policies may guarantee that the small, independent fisherman does go the way of the family farmer.

A serious problem caused by overcrowded fisheries is what economists refer to as "dispersion of rents." Many small-scale fishing operations are becoming marginal, unable to absorb the ups and downs of fish populations and fish prices, unable to compete with larger enterprises that can absorb these shocks, and therefore unable to stay in business.

Consequently, in the interest of maintaining the cultural value of small-scale fishermen, governments often step in with assistance programs, subsidies like those granted agricultural interests. But because fish are merely extracted, not cultivated like crops, these subsidies speed the process of depletion.

The primary interest of conservationists, and fishery managers for that matter, is not in social engineering. They do not and should not seek to sacrifice traditional ways of fishing on the alter of economic efficiency.

On the other hand, it must be acknowledged that our present situation of an excess number of fishermen exploiting limited and stressed fish populations is itself causing a radical re-structuring of the fishing industry. Any large-scale reduction in fishing effort and fishing mortality, necessary to bring catch levels into line with the productivity of the resource, will squeeze marginal fishermen out of the fishery.

There will be winners and losers no matter which path is taken. The relevant question is, will society plan and control the changing face of marine fisheries, or merely let the chips fall where they may? Doing the latter - allowing a laissez-faire restructuring of the industry strictly in response to the economic, not the biological, limits of the fishery - will mean survival of the fittest, with only the largest fishing operations staying in business.

Unquestionably, the implementation of any limited entry system will mean that some people who want to fish commercially won't be able to, and probably that many currently fishing will have to find something else to do. But these less palatable products of limited entry already pertain to the use of other natural resources. Indeed, one might say we are with marine fisheries now undergoing the fits and throes we've already experienced with management of other common property resources. To the extent we persist in thinking of ocean fisheries in different terms than other natural resources - allowing open access, no-fee fishing - this process will be all the more painful.

Appendix 2

PRIVATE PROPERTY AT SEA

Limited entry, by permitting a specific number of participants at the exclusion of others, automatically confers a type of property right to an individual, a preferential access to the harvestable resource. Some types of limited entry, such as individual transferable quotas, take that property right one step further by allocating specific shares of the resource to those permitted to fish. It is just that property right that is meant to provide the incentive to conserve for the long term by assuring the owner that the benefits of conservation will be available to those who practice it.

But that right must be carefully established for it to provide the appropriate incentives for conservation while avoiding some of the problems associated with private property. To advance fish conservation goals, this property right should have the following attributes and conditions:

1. Qualified Exclusivity - As envisioned, the right to fish is exclusive to those holding a permit. That is how a degree of "ownership" is established over the resource and the conservation incentive develops. However, fishing rights must be granted with certain constraints, e.g., with the understanding that it is a share of the catch, not an absolute number; the total allowable catch may change, and thus the share represent more fish or fewer fish. Conservation incentives are clearly established if fishermen are guaranteed a share of the resource rather than a specific quantity. Good management and wise use of the resources yields benefits that can be reaped by the fishermen who practice it. Poor management harms the resources and leads to lower allowable catches.

The key to success is an exclusive right to use a share of a resource and reap the benefits (and bear the costs) of its use. Outright ownership of the resource is not necessary and may in fact be a problem. Fishermen cannot be allowed to manage their shares independent of the other shareholders, as full ownership would allow. The ability to shift future harvests to the present in order to maximize profits - and a host of other independent decisions - would undermine the conservation goals.

Fish are perhaps somewhat unique because, while access to the resource may be controllable, ownership over individual fish or individual stocks is difficult if not impossible. What some fishermen do to their stocks can and often will affect stocks that others fish on, due to predator-prey relationships and the like.

2. Defensibility - The claim to a share in a fishery must be protected by law to offer proper incentives for conservation. If a shareholder has no expectation of maintaining his or her status as holding an exclusive right, there will be no incentive to build the resource for the future. On the other hand, the right cannot be absolute. The public must retain the right to revoke the share or otherwise penalize the shareholder if the resource is misused. There must be an incentive to play by the rules established by managers to achieve the goals of the quota-sharing system.

3. Enforceability - Shareholders need to trust that their rights are protected, and strict, tough enforcement will be needed to do so. Managers must be able to ensure that fishermen stay within their individual shares or quotas, and that those outside the system do not violate it. If the system works as intended, however, there is likely to be some self-enforcement, since the "property owner" has a vested interest to protect.

4. Transferability - Whatever rights are established must remain transferable. Fishermen who want to leave a fishery, for whatever reason, should be allowed to transfer or sell their share(s). Marketing of limited entry shares or permits would encourage those not efficient or profitable to exit and give those who wish to enter the fishery the opportunity to do so. It also allows those not offered an initial allocation a way into the fishery. Marketable transfers provide an additional conservation incentive, e.g., when stocks are high, the value of a given share will increase, providing an oppor-

tunity to cash in on the improvements. Transferability makes the system valuable to the initial owners - wealth is conferred on them by the government - and some fee system to recoup that windfall needs to be created.

5. Universality - Fishermen pushed out of one fishery are likely to end up in another. Fishing is a way of life that many prefer to pursue against sizeable odds. Since limited entry won't apply to all fisheries, there will always be some place else to go. Some argue that limited entry should be applied universally in order to prevent overflow from moving into unrestricted fisheries. Unfortunately, displacement may put pressure on fisheries to consider limited entry even though it may not be appropriate. Since it is not likely to be productive or efficient to apply limited entry universally, the potential impacts of displacement on other fisheries need to be carefully considered.

6. Flexibility - Limited entry schemes, like all forms of management, are experiments, so managers must retain the flexibility to change them as they learn what works and what doesn't. If rights within the system become entrenched, those politically and economically enfranchised by that system will resist change because of their investment in the *status quo*. Measures providing that flexibility need to be a part of the system from the start.

Once established, property rights are difficult to rescind. Fishing rights under limited entry would presumably be similarly tough to change. But if a particular program fails, removing or redefining that right may be necessary. Therefore the right must be carefully defined to avoid its becoming absolute.

The public must retain the right of ownership, the right to close down a fishery if it is warranted for biological reasons. Rights that are based on shares, with no guarantee that the allowable catch will always be above zero, provide a certain element of flexibility. However, there may be unforeseen consequences of rights-based fishing that need to be guarded against. It will be necessary to retain a qualified right to end a particular limited entry program if it fails to protect the resources; perhaps a sunset clause should be written into each program. No experiment, no matter how well conceived, should give away the public's resources permanently or withdraw the public's right to control how the resources are used.

The flexibility necessary to protect the public interest in fisheries will conflict to some degree with the similtaneous need to make fishing rights defensible. The degree to which the public can reverse privatization will reduce the expectation that future gains from current sacrifices can be fully recovered. There has to be a balance between flexibility and defensibility, with the public's interest in healthy oceans always the paramount concern. The terms of flexibility must be established upfront, before privatization occurs.

As a precaution, managers might consider reserving a share of the resource for conservation. A percentage of the total allowable catch could be set aside in the form of an unused share of the resource to be held by the public. It would act as a conservation buffer against uncertainties or inaccuracies in stock assessments or unpredictable fluctuations in stocks.

INDEPENDENT FISHERMEN FOR FAIR QUOTAS

2442 N.W. Market #349 Seattle, Washington 98107
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Statement of Principle, Objective and Purpose

Introduction

Under the present management system all commercial fisheries in the North Pacific EEZ have become over-capitalized. Fishery management has become increasingly politicized and inequitable, particularly with regard to allocation decisions. These trends are likely to intensify under either open access or license limitation. This in turn generates further destabilization of the resource and of the small fishing businesses and the lives of those who depend upon that resource.

The Principle

Accordingly, fishing vessel owners from across the various fisheries have formed a coalition founded upon the following principle:

> ***The first preference in allocation should be granted to those individuals first and longest in the fisheries.***
>
> We believe this is consistent with the requirements of the Magnuson Act regarding allocation found in National Standard #4 and further elaborated in section 303 (b)(6)B.
>
> This Coalition believes such preferential allocation is best implemented through an Individual Transferable Quota (ITQ) system.

The Objective

The objective of this coalition is to work toward adoption of an ITQ system which would:

- be a grant of ownership,
- be based upon harvest history,
- be to the individual harvesting vessel owner,
- be expressed as a percentage of the TAC or Harvest Guideline,
- be perpetual in tenure,
- be fully and freely transferable among US entities

The Purpose

It is the desire and intent of this coalition to participate in the wider ongoing discussion and negotiations concerning ITQs, both before the council and within industry.

In doing so, we recognize that other legitimate calls upon the resource may be made. However, before any particular claim is included in an allocation formula we would ask that the principled basis for its inclusion be clearly defined and weighted by merit.

We believe the legitimacy of our claim rests upon our history of dependence, past and present, upon the resource. It is the purpose of this coalition to educate the decision makers and the US public to endorse these principles as the first basis for allocation and to ensure that when compromises become necessary, the position of those first and longest in line be compromised last and least.

INDEPENDENT FISHERMEN FOR FAIR QUOTAS

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Vessel Membership List

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American Eagle	Arctic Eagle	Arctic Mariner
Arctic Wind	Aleutian I	Argosy
Bering Star	Caprice	Chelsea K
Denali	Entrance Point	Fierce Allegieance
Flying Cloud	Gun Mar	Halfmoon Bay
Katie K	Kevleen K	Kirsten Marie
Kjevolja	Margaret Lynn	Mar Gun
Mark I	Neptune	Nordic Fury
Nordic Star	North Western	Northwest Mariner
Norseman II	Ocean Fury	Oceanic
Pacific Challenger	Pacific Fury	Pacific Mariner
Polar Sea	Poseidon	Pro Surveyor
Progress	Rainier	Rosie G
Royal Atlantic	Seawolf	Shishaldin
Starlite	Starward	Sunset Bay
Tracy Anne	Vaerdal	Vesteraalen
Western Viking	Westpoint	Zenith

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8 February 1994

The Honorable Thomas Manton
Chairman
House Subcommittee on Fisheries
1334 Longworth House Office Building
Washington, DC 20515

RE: H.R. 780 - Individual Transferrable Quotas

Dear Chairman Manton and Subcommittee Members:

The Pacific Coast Federation of Fishermen's Associations (PCFFA) represents working men and women in the west coast fishing fleet. PCFFA's membership consists of 24 fishing associations, making it the largest commercial fishing organization on the U.S. west coast. Individuals belonging to PCFFA member associations are primarily fishing vessel owner/operators, along with some crewmembers -- essentially "family fishermen".

We welcome the Fishery Subcommittee's hearing on the issue of Individual Transferable Quotas (ITQs) and appreciate the opportunity to present written testimony on this means of limited or controlled access to fisheries. PCFFA has had considerable experience with limited access fisheries, having drafted successful limited entry programs for California's roe herring, salmon, driftnet and gillnet fisheries. Currently, PCFFA is developing a limited entry fishery for Dungeness crab and drafting a permit moratorium for the squid fishery (the first step toward a limited entry system). We speak from experience, not theory.

PCFFA wishes to commend the majority and minority members of the Subcommittee staff for their excellent background paper on ITQs. Many of the issues of concern to PCFFA were addressed in that paper, as you will note from our comments below. With the rush to ITQs coming from NMFS and some in the fishery, it is fitting and proper that Congress hold this hearing and debate the policy issues associated with the implementation of ITQs in the nation's fisheries.

The ITQ Hoopla

For the past few years ITQs have been touted as a sort of panacea, a "cure-all" for what ails this nation's fisheries, by everyone from economic rationalists, to fishery theorists, to the National Marine Fisheries Service. After all, it is argued, ITQs would be an efficient, market-based means of allocating fishery resources.

NMFS advocacy for ITQs, however, we believe, has been in part to distract attention from their failed stewardship over this nation's fisheries for the past dozen or more years. It is also argued that NMFS' fixation with ITQs is simply a means to diminish the role of, or eliminate, the regional management councils since, in theory, ITQs would make fisheries self-allocating. Further, concern has been voiced that NMFS promotion of ITQs is a ploy to exact economic rent from the fisheries, corporatize the fisheries, or both. Given NMFS track record, they are not promoting ITQs to benefit fishermen.

PCFFA is neither pro, nor anti-ITQs, but Congress is entitled to know why NMFS is focusing so much attention on this one regulatory tool and giving short shrift to its broader resource conservation responsibilities.

ITQs Are One of Many Forms of Fishing Regulation

At the outset of the ITQ discussion, it must be remembered that ITQs are a form of limited access to fisheries; and limited access, or limited entry, is but one of a number of tools for regulating fishing, along with seasons, time and area closures, trip limits, gear limits and restrictions, and quotas (as pointed out in the Subcommittee's background paper). An ITQ system is nothing more than assigning each entity, whether individual or corporate, licensed or permitted to participate in a given fishery, a share of an overall quota or total allowable catch for that fishery and then allowing those entities the right to buy, sell, trade or rent their shares in the fishery.

ITQs, like other forms of limited entry, are primarily utilized to protect the economics of the fishery participants. Seldom is limited entry a conservation tool, however, in limited entry fisheries, fishermen generally develop a greater conservation ethic than those in open access fisheries. In fact, an ITQ system if not properly designed or enforced can result in "high-grading", working counter to conservation measures.

Other than potentially making allocation more efficient, ITQs will not cure the myriad of other problems facing the nation's fisheries ranging from mismanagement to fish habitat destruction. ITQs will do nothing for Snake River sockeye, or Sacramento winter-run chinook, or New England groundfish.

ITQs Will Not Work For All Fisheries

A case can be made for implementing an ITQ system for some of the nation's fisheries (see attached editorial from the 6 December 1991 issue of FRIDAY), but ITQs will not work for many fisheries. To begin with, there must be either an overall quota or total allowable catch for the fishery from which to develop individual shares or quotas. Many fisheries are governed by size limits (e.g., Dungeness crab), or seasons (e.g., salmon), or gear restrictions (e.g., Pacific driftnet swordfish fishery), not a total allowable catch or overall quota, and therefore do not lend themselves to an ITQ system.

ITQ Systems Are Expensive

ITQ systems are the most expensive of any limited entry system to operate, First, they require monitoring of each vessel's landings, not simply the cumulative landings of the fleet, to ensure the vessel does not exceed its allocated quota. This means extra enforcement costs to assure vessels do not under-report landings. The monitoring/enforcement cost, however, should be no greater for an ITQ system in those fisheries where vessel trip limits (e.g. Pacific Coast groundfish) or individual vessel quotas (e.g., San Francisco Bay herring purse seine fishery) are in place. Second, ITQs require greater record-keeping to track the amount of shares or quota held at any given time by a vessel (participant). Third, as Subcommittee staff noted, there are increased enforcement costs associated with longer seasons or fishing periods that occur with ITQ systems.

The cost of an ITQ system may be offset in part or totally by fees placed on the amount of share or quota held and/or the transfer of shares or quotas, but that is unlikely. For some of the more prosperous fisheries the cost of implementation may not pose an economic hardship on participants, but where the fishery is depressed, attempting to impose upfront quota fees or transfer fees may create a significant burden. Can an already financially strapped NMFS afford to underwrite ITQs for those fisheries that cannot pay the management costs?

Fundamental Policy Change

Because limited entry systems, especially ITQs, mean a fundamental change in the rights to or ownership of fisheries, the policy should be debated and set by Congress, not by a regulatory agency such as NMFS. The Subcommittee staff did a good job of setting forth some of the policy issues. The following is a list of issues of concern to PCFFA that need addressing in the policy debate over ITQs.

<u>How are quotas to be assigned?</u> There are at least three ways of assigning quotas or shares to a fishery. The first is by put-

ting the shares out to bid, either initially or each year (season). This is similar to what occurs, or is supposed to occur, for federal timber sales. The problem with this method, is that the resource would end up in the hands of the highest bidder resulting in the displacement of traditional participants and the potential concentration of the resource in a very few hands. It does not always result in the public getting the highest value for its resources as we know all to well from the government's sale of everything from timber, to oil and gas leases, to grazing rights. This system probably should be avoided.

The second way of assigning quota or shares is to simply allocate each participant an equal share. This is somewhat akin to the way California manages its purse seine herring fishery -- every boat is given an equal quota annually -- but those quotas are not transferrable, although the permit to the fishery is transferrable. The problem with this is that the level of harvest in many fisheries varies widely between participants and this could penalize those who work harder or with larger investments.

The third way of assigning quota is based on a participant's past landing record. For most fisheries where an ITQ system would work this is perhaps the fairest method for assigning quota. However, even this method has problems when made overly restrictive through the imposition of high minimum landings or very narrow window periods in which to qualify for an assignment of quota. This is exactly what the Pacific Council and NMFS is doing with Pacific Coast groundfish as it moves from a highly questionable limited entry system into ITQs.

Congress needs to establish policy regarding issuance.

Charging Economic Rent. Proponents of economic rent cite oil and gas leases, sales of timber and mineral rights as precedent for charging fees for quotas or shares in a fishery. Indeed, it would be good policy to exact such rent where the participants tend to be a few large entities and the potential profits also large. (But keep in mind the influence large operators have had in the past over public sales and leases of resources and their ability to manipulate bids and hold prices down.) The participants in most fisheries, however, tend to be small operators -- a small business or family operation, a vessel owner/operator -- and there also tend to be a larger number of these individuals operating on small margins.

Currently the "rent" from fisheries is not paid directly to any government agency but, rather, in the form of employment and other economic activity in coastal communities. PCFFA believes the benefit to the public from having a large number of smaller operators, as opposed to a few large corporations controlling the resource, is both economic and social. A good analogy can be made to California's San Joaquin Valley, comparing the family farms of

the east side to the corporate agribusiness operations on the west side. Thus, the policy on economic rent for an ITQ system made up of a few large operators with large profits, should, we believe, be different than that from a system made-up of a large number of small operators with smaller margins. In fact, direct payment of "rent" should be waived to achieve the other economic and social benefits under the latter scenario.

Congress needs to establish policy on economic rent.

Amount of quota held. Another policy issue to be dealt with in the establishment of ITQ systems is the amount of quota any one entity may hold. Subcommittee staff addressed this issue in its discussion of Industry Concentration and Market Power in the background paper. If ITQs systems are established, we believe, it is clear that limits must be placed on the total amount of quota or shares any one entity may hold. This is not a matter, as NMFS once said, for the Federal Trade Commission. It is a fundamental fishery issue and must be addressed in any ITQ system.

The Mid-Atlantic surf clam fishery amply demonstrates what happens when controls are not placed either on how much quota any entity can control or who controls the quotas. The surf clam fishery is now, as a result of ITQs, a share-cropper fishery. The companies hold the quotas and tell the fishermen when to fish and how much they will be paid. There are now fewer fishermen and they are earning less. Among other things, Congress ought to demand a full report from NMFS on this fiasco, including the reports on this fishery NMFS has sought to bury or sanitize.

Congress needs to establish policy on quota caps.

Who gets the quotas? Finally, there is the issue of who gets the quotas. It may matter less who is assigned the quotas than who is subsequently entitled to purchase them. Unless restrictions are placed on who can own shares or quotas, there is a real likelihood these will be bought up by speculators or companies then leased back to fishermen under onerous conditions. It is our belief that ITQs should only be held by vessel owners or operators, or their crew, to prevent the reimposition of a share-cropper system.

Likewise, we believe, controls need to be placed on the issuance of community quotas or shares. Community quotas may provide a means of protecting historic fishing communities, provided the quotas are issued to fishermen in those communities and can only be transferred to other fishermen within that community. However, they are of questionable value where the community simply turns around and leases them to a factory trawler operator or some other entity with no ties to the community. The social purpose, and perhaps even the economic purpose of community quotas, is destroyed where transfers or leases of quotas are allowed outside of the community.

Congress needs to establish polcy on who may hold quotas.

Mr. Chairman and members, we wish to thank the committee for the opportunity to provide our thoughts on the issue of ITQs, as one more of the numerous tools to regulate our fisheries. If there are questions of us, please do not hesitate to have your staff contact our office.

Sincerely,

W.F. "Zeke" Grader, Jr.
Executive Director

WFG:rtd

enclosure

FRIDAY'S CURMUDGEON

ITQS NEEDED NOW, NOT LATER FOR GROUNDFISH

I have never been a big fan of Individual Transferable Quotas. ITQs (or IFQs -- Individual Fishermen Quotas, as they are sometime called) are a form of fishery limited entry that requires extensive monitoring and, depending on the specifics of the program, can result in the ownership of the resource being held or controlled by a few individuals or corporations. ITQs only work where there is reasonable confidence in the overall catch quotas (something that is lacking in the ocean salmon fishery, for example). Further, ITQ systems do nothing for resource protection.

But after reviewing the latest feeble attempt by the Pacific Fishery Management Council to implement a limited entry system for its groundfish fishery, and after considering the different gear types, markets and species mix in this fishery, it is clear to me that some form of ITQ system is the only workable and fair mechanism for controlling effort in that fishery. Having had considerable experience with California's salmon and herring limited entry programs, as well as a number of others, and having read extensively reports of various limited entry programs nationally and internationally, it is my opinion ITQs are the only solution. I should say here that these are my opinions only and do not reflect those of the PCFFA Board. The Board has taken a position of formal opposition to the Pacific Council's proposed plan, but has not yet decided whether to offer an alternative plan, or simply to oppose limited entry for this fishery.

At the outset it should be recognized that the PFMC's groundfish limited entry plan is a total flop and the sooner a bullet is put through this turkey's head the better. Make no mistake about it, this plan was designed specifically to benefit a select group of larger trawlers and longliners from the Northwest. In truth, they drafted it and the PFMC rubber-stamped it. PCFFA participated early on in the drafting, but once trolling was exempted form limited access, its seat on the committee was eliminated. The proposal changed drastically following PCFFA's departure from the committee, and subsequent concerns raised by fishermen from Santa Barbara, Half Moon Bay and elsewhere went unheeded by the committee and, later, the Pacific Council.

The PFMC's plan would create two categories of fishermen. The first are those who get limited entry permits -- trawlers, longliners and pot fishermen who met the landing requirements between the arbitrarily imposed dates of July 1984 and August 1988. Keep in mind, the plan was not officially adopted by the PFMC until November 1991 and there was no moratorium on licenses imposed prior to its adoption. This first group will be able to buy and sell its permits. Further, this group will have its own quota and once it finishes it, it will be able to fish on the second category's -- the open access group -- quota.

The open access group consists of other "lesser" gear types such as troll, gillnet, seine, wire-line and Portuguese hook-and-line, as well as long-line and trap fishermen who did not meet the minimum landing requirement during the qualifying period. Trawlers who did not meet the minimum landing requirements, such as many of those in Santa Barbara whose fishery was disrupted in the mid-80's by oil industry seismic testing, are out of the fishery completely. Once the open access quota is filled, open access fishermen will have no rights to fish the limited access quota if it has not been filled. And you can bet that the open access quota will be small.

As a lawyer, and one who still remembers something of Constitutional law, the whole plan is, to me, a wholesale violation of due process and equal protection. The problem will be that many reviewers are unlikely to discover the flaws inherent in the plan since it is so poorly written. Frankly, the only thing worse than the plan itself is the way it was drafted. Perhaps the authors felt it necessary to obfuscate and confuse to hide the impacts of its implementation. My friends at the Office of NOAA General Counsel were no help in all of this and actually did a disservice to their clients. At the November PFMC meeting, the NOAA attorneys seemed lost in the thicket of federal regulations, seemingly without either a map or a compass -- the Magnuson Act and the Constitution -- to give guidance to the Pacific Council.

The PFMC's plan is also overly rigid. It gets hung-up unnecessarily on gear type and vessel sizes. If a fisherman wants to change gear, for reasons of markets or by-catch they should have that flexibility. And, since trip and other limits are imposed, what difference should vessel size make? Fishermen should have the ability to freely change or upgrade vessels for safety and/or operating efficiency.

ITQs are discussed in the PFMC's plan, but are dismissed as a tool now because of enforcement concerns and the time it would take to set up the system. Those arguments against an ITQ system are specious. In fact, ITQs are considered for a later date by the authors, presumably after many in the open access fishery are eliminated and those in the limited access fishery will be able to lay claim to a larger quota share. The fact is that an ITQ system should not result in any greater enforcement/monitoring than is required under present regulations to enforce vessel trip limits. And, since the PFMC's plan is not scheduled for implementation until 1994, there is ample time to set up an ITQ system to be in place by or before 1994.

How could an ITQ system work in the groundfish fishery that would be fair and equitable and still limit effort? If limited entry is necessary for the groundfish fishery, and I believe it is, the following is to me the best way to implement it. First, forget the existing qualifying period; too much time has passed since the cut-off date of 1988. To be fair, it needs to be for a longer period, perhaps 10-years -- January 1982 to January 1992, for example. This would take in groups such as the Santa Barbara trawlers and longliners in Half Moon Bay.

Second, for purposes of qualifying, forget the minimum number of landings and weight and species of fish landed. One landing of one fish (in the groundfish complex) should be sufficient, as it is for qualifying for most other limited entry programs.

Third, and to be fair and prevent this low qualifying requirement from being abused and recognizing the significant past landings made by larger vessels, the quotas assigned to each fishermen/permit holder should be based on previous landings, say an average of three of the top years of landings out of the past ten. This figure, then, would be used to determine the amount of quota allocated to the individual for setting his or her initial ITQ. After that the individual would be free to buy or rent additional quota from other ITQ holders, or sell or rent that quota to other ITQ holders. This is fair to the larger vessels owners since their initial quota would reflect their past landings. It would be fair to those just starting, or whose fishery had been interrupted, because they would qualify for an ITQ and could buy or rent additional quota to provide them more of a fishery. And, for the individual who was in the process of buying or building a vessel with the intent of getting into the fishery at the time the system was implemented and had no landing records, they could be provided the right to rent or purchase shares from other ITQ holders willing to rent or sell all or a portion of their quota.

Fourth, to prevent any one individual, company or corporation from buying up quota and subsequently controlling much of the resource, as has happened in other ITQ systems, a cap should be placed on how much of the total quota of the resource could be controlled by a single individual, company or corporation. As a rule of thumb, I would recommend not more than one-half of one percent of the total quota. Thus, if all ITQ holder had their maximum permitted shares, there would still be at least 200 vessels operating in the fleet. For some of the groundfish species, however, the cap could be loosened. For example, in Pacific whiting it could be as high as five percent ownership of the total quota by an ITQ holder.

Fifth, new entry into the fishery should have some form of qualification other than an individual or corporation merely being able to buy their way in. Restricting shares, and the right to purchase them, solely to the owner or operator of a vessel used in the fishery is my recommendation for those holding ITQs. New entrants owning or leasing a vessel would be required to have had experience in the fishery -- as a crewmember, for example -- prior to their being able to hold ITQs shares. Thus, existing ITQ holders would be assured new entrants had some level of experience in the fishery and crewmembers on ITQ vessels would be given a preference for entering the fishery later as owner/operators of their own vessels. Further, restricting new entrants to those with past experience would help keep down the cost of entering the fishery.

Sixth, compliance with the system could be strengthened by stiff penalties. Persons who exceed their quota for a given species, but who report it, would be

required to give the proceeds of that excess to a regulatory authority. This process is currently in use successfully in California's herring fishery. Where an ITQ holder fails to report any amount of fish taken in excess of their quota they would be subject to a loss of their ITQ. The weight of this penalty -- both loss of future fishing income as well as the loss of the value of the ITQ shares -- should act as a deterrent to cheating.

Seventh, the cost of operating this system could be offset in part or in whole by a transfer fee of shares for every sale or rental of quota. A five percent fee, for example, is in line with fees charged presently for the transfer of stock shares or the sale of real estate. A share exchange system could be set up for the sale or rental of quotas that would provide a mechanism for monitoring not only the amount of shares each ITQ holder has at a given time, but the prices being paid as well.

Finally, the system I have outlined above would not have to concern itself with either gear or vessel size. ITQ holders would not only have the freedom to fish when conditions, such as when markets and weather, were best but would have flexibility in their choice of gear (other than, perhaps, environmental considerations) and vessels. Indeed, they would not be locked into gear types that did not allow them to maximize the value of their catches and/or minimize by-catches, or be stuck operating vessels consuming too much fuel or that were unsafe.

Again, I want to reiterate that the above are my thoughts alone for a fair and equitable alternative to the turkey the PFMC has served up. Not all of the details have been spelled out and there may, in fact, be other mechanisms that could meet the test of flexibility, fairness and equity as well. All things considered, I am of the opinion that a carefully-structured ITQ system is the only answer for groundfish limited entry and that it is needed now not later. - ZG

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REMINDER - WETLANDS COMMENTS DUE

The deadline for commenting on the Bush Administration's revised wetlands manual -- changing their definition and removing approximately 33 million acres of existing wetlands from protection -- is 24 December (not 14 December as earlier reported in FRIDAY). Fishing organizations, as well as individual fishermen need to let the President and the Environmental Protection Agency (EPA) know that they will not tolerate weakening of wetlands guidelines (see FRIDAY, 22 November, p.12; 16 August, pp.11-12; 19 July, pp.4-7). Wetlands are the cradle of the seafood industry and commercial landings of wetland-dependent species was worth over $6 billion to the U.S. economy.

FISH (Fishermen Involved in Saving Habitat) is requesting that comments be sent stressing the following:

STATEMENT OF GREENPEACE

Greenpeace has many concerns regarding individual fishing quotas (IFQs). Types of quota plans which privatize the resource are referred to as individual fishing quotas (IFQs), individual transferable quotas (ITQs) or individual vessel quotas (IVQs). For the purposes of this paper, the term, IFQ will be used to express the general concept of privatizing fisheries.

As you may know, Greenpeace is an international environmental organization with 1.6 million members in the United States and offices in 25 countries. The organization is dedicated to the protection of the planet and its myriad creatures and ecosystems. For a number of years, our organization has been involved in fisheries management for almost seven years. While our focus has been in the North Pacific, we were involved in the last Magnuson reauthorization and helped bring together the Marine Fish Conservation Network for the current effort.

Fisheries in the United States suffer from a variety of problems ranging from loss of habitat to overexploitation. The National Marine Fisheries Service (NMFS) reports that 65 (or 42%) of the 153 known fish stocks in federal waters are overexploited. Greenpeace does not believe that the numerous problems affecting U.S. fisheries can be solved by implementing a system of IFQs, and privatizing this public resource.

The current crisis in U.S. fisheries was predicted in the mid-1970s, and resulted in the passage by Congress of the Fishery Conservation and Management Act of 1976, (Magnuson Act). At the time of the implementation of the Magnuson Act, the status of fisheries in the United States warranted protection, and prudent conservation and management. Unfortunately, under the Magnuson Act, efforts to develop the U.S. domestic fishing fleet, through economic development assistance and elimination of foreign competition, forced conservation to the wayside. These incentive programs were developed in the form of low interest loans and preferential allocations, to encourage U.S. participation in fisheries development.

These priorities remain in force, and little has been done to improve the way in which fisheries are prosecuted or to provide for the sustainability of fish stocks. This has resulted in a situation where we now have too many vessels chasing a finite, and in many cases, decreasing amount of fish. Furthermore, little effort has been made to improve the manner in which fish are caught, (e.g. improving the selectivity of fishing gear). And, nothing has been done to offset the exorbitant costs of managing fisheries resources.

The National Marine Fisheries Service (NMFS) is responsible for the sound stewardship of our national living marine resources. As such, it is the responsibility of NMFS to weigh all concerns,

including social and ecological, when addressing fisheries management issues and decisions.

By supporting and promoting IFQs, which would transfer the ownership of our national fisheries to private entities, NMFS apparently believes that fisheries management will be made simpler. In fact, NMFS will be ceding all or most of its authority and responsibility to manage and conserve U.S. fish stocks in this transaction.

Greenpeace believes, for the reasons listed below, that IFQs will not solve the myriad problems facing U.S. fisheries:

a) IFQs do not have conservation oriented objectives; they are largely profit driven. Because the fishing fleets of the world are over-capitalized and over-subsidized, there is a rush to secure economic investments in the fleet. However, as has been illustrated by those countries that have adopted IFQ regimes, IFQ plans will double or even triple current implementation and enforcement costs. Taxpayers will once again bear the burden of funding the implementation of a program that does not solve the numerous problems currently facing U.S. fisheries. Moreover, taxpayers should not be required to fund a program which privatizes what was previously a publicly held resource.

b) IFQ systems do not resolve the problems of inherently "dirty" fisheries (i.e. those fisheries with high levels of bycatch and discards). Such fisheries will not be cleaned up by IFQs. Instead, they will be legitimized, as historical bycatch levels are allocated so that the target species can continue to be caught. Additionally, because each vessel operator will have a given quota, the incentive to "high grade"- keep only the most marketable fish - will intensify and discards will increase dramatically.

c) Supporters of IFQ systems argue that they consolidate the number of fishing vessels in operation. But this does not address the problem of "capital stuffing"; improving the catching capacity of those vessels that participate in a given fishery. The issue of overefficiency will not be addressed.

d) The "race for fish" will not be slowed or stopped under an IFQ system. Fisheries that currently operate within a specific window of time, e.g. the pollock roe fishery, will continue to do so. Further, because of the high value of pollock roe, most vessels will continue to fish their quota during the spawning season.

e) IFQs will facilitate the concentration of fisheries resources into the hands of large corporations and will virtually eliminate small-scale fishery operations, which arguably contribute substantially more in economic and social terms to the coastal communities in which they operate.

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f) Upon implementation of IFQs, fishing will no longer be a privilege which is contestable by citizens. The privatisation of our fisheries will eliminate citizen participation, including the right to challenge, fishery management decisions. The ability to challenge fishery management decisions in a court of law will be nearly impossible on the basis of property rights.

Open access fisheries are difficult to manage. As vessels continue to enter a given fishery, seasons become shorter, total allowable catches (TACs) are exceeded, and inevitably more harm is caused to the resource. Limited entry programs are the alternative to open access, yet NMFS has failed to proactively limit participation. There are numerous types of limited entry programs which may address some problems in each fishery. IFQs are not the only option.

Again, Greenpeace does not support NMFS' attempt to relegate its authority over living marine resources by giving away the marine resources of the United States and creating private holders whose overriding concern is with maximizing short-term profits. NMFS' failure to uphold the stewardship of our marine resources is no excuse for NMFS to yield its obligation to conserve our fish populations altogether.

Rather, we advise NMFS to move forward proactively by adopting and implementing suggestions as put forward in its 1991 Strategic Plan for the Conservation and Wise Use of America's Living Marine Resources. Interestingly, NMFS attempts to make a fundamental departure from the approaches of the past and acknowledges that effective conservation encompasses the ecosystem as a whole. In particular, it calls for:

1. Controlled access to fisheries to reduce the tendency toward excess fishing capacity, economic waste, conflicts between groups, and industry pressure to make "risk prone" decisions;

2. Development of more selective fishing practices to reduce bycatch;

3. Implementation of a cohesive strategy, built on all applicable legislative authorities, to protect and restore marine ecosystems;

4. Reduction of uncertainty by greatly expanding the scientific information base upon which decisions are based;

5. Risk averse decisions in the face of uncertainty (i.e., erring on the side of conservation, not resource depletion). Obviously missing from this list is the consideration of biological interactions. There is a pressing need to manage marine exploited species in the context of the ecosystems of which they are an integral part, both to achieve sustained use of living marine resources and to protect non-exploited species and

the integrity of their interactions.

We are at a critical juncture where we have a choice; either drive our remaining fish stocks into depletion or move toward sustainable fisheries management.

And Then There Were NONE

Overfishing and Ocean Ecosystems in the Northeast Pacific

GREENPEACE

"Huge as the total catch might seem, the catch per vessel was down and the fish were running generally smaller than before, even though the foreign vessels fished longer hours with improved methods over a larger range for a greater part of the year... [When this happens]... it is nearly always an early and sure warning of the general decay of major fishing areas. First observed in the Old World with the herring and sole of the North Sea and the cod of Norway's Arctic grounds the phenomenon now seemed to be repeating itself in the Northwest Atlantic. Everywhere the factory trawlers went, in other words, more were fishing for less."

-William Warner describing the fate of North Atlantic fisheries in his book, **Distant Water** (1977)

The Northeast Pacific ecosystem supports the largest single-species fishery in the world for Walleye pollock. In 1992, over 2.9 billion pounds of pollock were caught, valued at more than $324 million.

ARE THERE REALLY 'PLENTY OF FISH IN THE SEA?'

The notion that the bounty of the sea is unlimited is deeply rooted in our culture. Similarly, there is a tendency to believe that the oceans' capacity for abuse is endless. Both of these assumptions are false.

In the oceans of the world, overfishing and other wasteful and destructive fishing practices are dramatically reducing fish catches. When fish stocks decline, the marine food web is weakened and possibly broken, triggering a cascade of changes in the abundance of other species and major shifts in ecological relationships, affecting marine mammals, seabirds and other fish.

Moreover, overfishing and alterations in marine ecosystem structure often have devastating social and economic impacts which reach well beyond ocean boundaries. Coastal fishing communities are particularly hard hit by unsustainable fishing and poor fisheries management. Management systems put in place by governments to control the excesses of fishing are fatally flawed and in desperate need of attention.

According to the National Marine Fisheries Service (NMFS), the federal agency overseeing U.S. fisheries, 80 percent of the known commercially valuable fish populations (122 aquatic species) are currently fully or overexploited. Another 79 species continue to be exploited while their stock status is unknown. These numbers clearly indicate a profound inability to conserve, manage, and catch fish sensibly and sustainably. Even in the country's most productive fishing grounds—the vast region of the Northeast Pacific—there are signs of trouble.

THE NORTHEAST PACIFIC: AN ECOSYSTEM ON THE EDGE

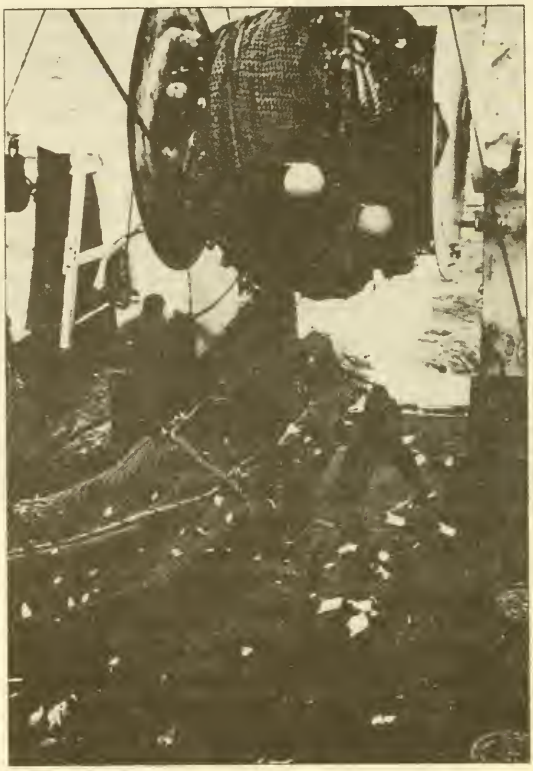
The Northeastern Pacific ecosystem includes the waters of the Eastern Bering Sea (EBS), Aleutian Islands (AI) and the Gulf of Alaska (GOA). Together, these waters support the largest single-species fishery in the world for Walleye pollock. In 1992, over 2.9 billion pounds of pollock were caught, valued at more than $324 million.

While the Northeast Pacific is still one of the most productive ecosystems in the Northern Hemisphere, the region may soon suffer the same fate as the North Atlantic, where indiscriminate fishing practices, overexploitation, and mismanagement brought about a series of biological and commercial fishery collapses.

Fisheries off of Alaska have been subject to over three decades of excessive exploitation. Fish stocks abundant in the 1960s, such as Pacific Ocean perch and herring, were fished to low levels only to be replaced in the catch by other commercially viable fish species, such as pollock and Atka mackerel. Due to these "boom and bust" fishing cycles and the cascading ecological effects which result, fisheries of 30 years ago, and arguably ecosystems of 30 years ago, are vastly different from those in existence today.

Despite evident symptoms of an ecosystem in distress, fisheries exploitation patterns in the Northeast Pacific have not improved nor has the health of the ecosystem.

Since 1986, the number of factory trawlers working the Northeast Pacific has increased from 12 to 65. It is not uncommon for a factory trawler to pull in 350,000 pounds of fish in a single haul.



Commercial fishing operations of today employ hi-tech equipment to locate and catch fish. Over-efficient technology is a major cause of overfishing.

A BOOM IN BOATS BRINGS A FISHERIES BUST

Following the implementation of the Magnuson Fishery Conservation and Management Act (Magnuson Act) in 1977, the composition of the North Pacific fishing fleet changed dramatically. The goal of this Act was to "Americanize" fishing. The Act established a 200 mile Exclusive Economic Zone (EEZ) to drive the foreign fishing fleets outside U.S. coastal waters, thereby reserving fishing resources for the emerging domestic fleets, and protecting the fisheries from foreign overexploitation.

Prior to the Magnuson Act, most U.S. vessels working in the North Pacific fished largely for highly valued species such as halibut, salmon and crab. However, after the Alaskan king crab collapse of the early 1980s, U.S. companies vied for other markets. The foreign vessels which concentrated on groundfish stocks provided a rallying point for "Americanization."

The promise of the groundfish fishery prompted the conversion of crab pot vessels to groundfish trawlers. With preferential allocation of fish quotas to U.S. fishers, and incentives provided by the U.S. Government in the form of low interest loans to build, rebuild and modify boats, the domestic fishing industry quickly became overcapitalized. There were too many boats catching a limited amount of fish.

The transition from purely foreign fishing to "Americanization" was facilitated by joint venture agreements, where U.S. fishing vessels

partnered with foreign processing vessels within the EEZ. The joint venture era ended with the rapid overdevelopment of the U.S. factory ships. These ships could catch and process fish simultaneously, doing away with the need for foreign technological assistance and increasing the so-called "efficiency" of fishing.

Transferring fishing ability to U.S. vessels was heralded as the cure for all of our declining fish stocks, and became the primary management objective of the Magnuson Act. However, while "Americanization" has been achieved, little has changed with respect to overfishing. In fact, U.S. fishing capacity has eclipsed the foreign fishing capacity of the late 1960s. In the North Pacific, waters that were once dominated by factory vessels from Japan, China, Taiwan, Poland, Russia and South Korea, are now commanded by factory vessels from the United States.

Currently, several stocks in the waters off Alaska are in danger of being overfished. Pollock, numerous rockfishes, and Pacific cod exhibit signs of declining abundance. Yet, fishing efforts continue to increase. The groundfish fisheries off Alaska are managed as open access fisheries, with no restriction on the number of boats that can participate. This has led to a high degree of overcapitalization, shrinking fishing seasons, difficulties in managing fisheries within established quotas, and increased industry pressure for higher quotas of commercially important species.

Advances in fishing technology—a symptom of large fishing corporations' quest for greater short-term profits—have also played a considerable role in increasing capacity and efficiency. Factory trawlers, many as long as 300 feet, pull massive funnel-shaped nets through the sea, scooping up everything in their paths. These vessels catch and process fish while at sea and are some of the largest ships in the North Pacific.

However, technological fixes have also enabled smaller vessels to increase their capacity to meet, or in some cases exceed, that of the factory trawlers. The North Pacific is home to one pollock trawler delivering to a shore-based plant that can catch up to 600 tons (over one million pounds) of fish in a single tow. Although not all small trawlers employ such mammoth nets, the larger factory trawlers plying the waters off Alaska often take 350,000 pounds of fish per haul.

OVERFISHING THE ECOSYSTEM

With modern, overly efficient vessels racing to catch as much fish as possible, conservation is often compromised, raising the threat of overfishing. Overfishing, although a broad term, can be described as taking more fish from a stock than can be naturally replaced.

The detrimental effects of annually removing billions of fish from the marine ecosystem, in an unsustainable manner, on predators (birds and marine mammals), on competitors (other species of fish and invertebrates), and on the system itself are likely to be significant. Overfishing can dramatically alter species composition in

Americanization of the U.S. EEZ under the Magnuson Act has done little to address overfishing. In fact, U.S. fishing capacity has eclipsed foreign fishing capacity of the late 1960s.

marine ecosystems; induce changes in marine biodiversity; and pose grave threats to populations of marine mammals, seabirds, and other important predators in the marine food web. The dilemma at this juncture is that these impacts are not quantifiable given the limited research and knowledge currently available. However, important changes have already occurred in the species composition of the groundfish communities of the EBS, AI and GOA during the 1980s. In the EBS, pollock and Greenland turbot have declined significantly since 1979 (40 percent and 35 percent respectively), whereas flatfish and skates which have not been targeted commercially have increased dramatically (450 per cent and 600 percent). In the AI, pollock is relatively much less abundant, while the abundance of Pacific Ocean perch and Pacific cod has almost doubled. The GOA groundfish community has also undergone major changes in recent years. From 1984 to 1990, pollock has halved, thornyheads have almost disappeared, and the abundance of flatfish species has increased by 20 percent.

Throughout its' Alaskan range, the once ubiquitous Steller sea lion is steadily declining. Since 1960, the sea lions have decreased from more than 160,000 to little more than 20,000 today.

In addition, overfishing appears to have ramifications throughout the ecosystem. For example, the expansion of the pollock fishery in past decades has coincided with significant population declines in marine mammals such as Steller sea lions, Northern fur seals, and harbor seals. For all of these species, pollock makes up an important portion of the diet. Steller sea lions have suffered the most severe downturn. In Alaska, the sea lion population has declined by over 80 percent since the mid-1950s, and was recently (1990) listed as "threatened" under the Endangered Species Act (ESA).

Seabirds, such as blacklegged and redlegged kittiwakes and common and thick-billed murres, have also shown significant declines in abundance during the past 20 years. Since 1976, these species of birds have decreased by 50 to 90 percent in the Bering Sea. These declines are also apparently caused by the unavailability of food, in this case, young pollock.

An over-arching problem with fisheries is the single-species approach to management, which views each fishery individually and discounts the relationships between both commercial and non-commercial species and the ecosystem. This approach fails to consider food web interactions between fish populations, thereby ignoring the impacts of removing fish that are either predators of or food sources for other species. Instead, each stock of fish is managed in a vacuum, ignoring the

Common murres are one of a number of seabirds that are experiencing severe population declines in the Northeast Pacific. Like the Steller sea lion, these birds rely heavily on pollock for food.

potential longterm effects on the entire marine system. The "boom and bust" style of fisheries exploitation, where one species is targetted, depleted and then replaced by another target species, only exacerbates the problem.

In the North Pacific, there is continued denial of the importance of pollock and other forage fish in the diets of various seabirds, marine mammals and other marine species. Quotas for commercial fish species continue to increase, irrespective of the potential impacts on the food web.

BYCATCH AND DISCARDS: UNIMAGINABLE WASTE

Marine creatures including mammals, seabirds and fish (regardless of commercial value) that are not part of the "directed catch" (i.e., species that a vessel is targeting in a particular fishery) are often killed and discarded in the course of commercial fishing operations. Portions of the directed catch are also discarded in the form of individual fish deemed too small, or of the wrong age or sex to be of value to the fisher. The problems of bycatch and discards are pervasive in many fisheries, and are aggravated significantly by indiscriminate fishing practices.

In Alaska alone, over 500 million pounds of fish are discarded annually, most of which is thrown overboard dead. Fish brought to the surface from great depths can suffer fatal internal injuries due to pressure change, and others often suffocate on deck long before the day's catch is sorted and the incidental catch returned to the sea. Many fish are also fatally damaged by various fishing gear.

Data collected by government biologists on board fishing vessels in 1990 shows that discards in the EBS/AI amounted to 13.4 percent of the total catch, and were 26 percent of the total catch in the GOA. These discards amount to a substantial fraction of the total biomass of fish removed from the U.S. EEZ in the North Pacific. Pollock, flatfish, skates, sculpins, and sharks suffered the largest discards. Smaller quantities of other species or groups of fish were also discarded. The impact on these populations may be significant if the stocks are depleted and/or the species have slow growth rates.

Overall, discard mortalities have not been properly accounted for, and tend to increase annual catch quotas beyond acceptable biological limits. In addition, severe mortalities of non-target species as bycatch have serious implications for the marine environment. Since little is known about marine species that are not commercially valuable, the impact of removing these may never be known. Yet, these species may include indicator species (rays, sculpins), food fish (sandlance, capelin), and other forage fish for top predators and invertebrates, all of which are critical to the healthy functioning of the ecosystem.

Recycling of discards into the marine food web may affect ecosystem relationships in more indirect ways. Artificial additions of dead fish may cause changes in community structure and diversity by increasing the number of scavenger and decomposer species. There is also some concern that discarding could have adverse effects on the seabed, including the possibility of oxygen depletion.

In addition to the problems of bycatch and discards, indiscriminate fishing (e.g., bottom trawling) has other detrimental side effects. Trawling directly and indirectly damages the rich benthic (bottom-dwelling) communities. Direct effects include physical destruction of organisms and the sea floor as gear is dragged along the bottom. Indirect effects include the resuspension of sediments, toxic chemicals and nutrients with a direct impact on overall ecosystem productivity.

In Alaska alone, over 500 million pounds of fish are wasted each year, dumped back into the ocean, dead or dying. Worldwide, bycatch amounts to an estimated 12 to 20 billion pounds of sea life every year.

Bycatch and discards aggravate the problem of overfishing and because discards are largely unaccounted, the result is increasing annual catch quotas beyond acceptable biological limits.

THE SOCIAL CONSEQUENCES OF OVERFISHING

Overfishing causes severe economic hardship for coastal fishing communities as small fishers are squeezed out of business. The traditional image of rugged individuals braving storms to wrest a meager living from the sea is fast fading from our cultural horizon as corporate fishing interests take over fishing grounds and seafood markets.

Large-scale operations can fish faster, cheaper, and in higher volumes than the small-scale fishers. In profit driven fisheries, success correlates with the level of "efficiency" attained. This measure, however, fails to consider either the importance of fishing to local families and communities, or the impacts of industrialized fishing on the fishery resource itself.

When fish stocks collapse, corporate fishing interests and their mobile factory vessels simply move on to other fisheries. With no ties to local communities, these boats have been known to overfish an area, and then move on to more lucrative fishing grounds, leaving residents with an ecological disaster.

By the same token, similar consequences can arise when there are simply too many boats pursuing a limited amount of fish. According to a 1990 report from the Massachusetts Offshore Groundfish Task Force, landings of New England groundfish have hit all-time lows, and some species—haddock and redfish—are yielding less than 10 percent of their long-term potential. Most New England groundfish stocks are currently classified as overexploited. The reduction in annual landings of groundfish by 55,000 tons has cost $350 million and 14,000 jobs.

While factors contributing to the decline of U.S. fisheries are manifold, one glaring problem is the present structure of the U.S. fisheries management system.

The majority of pollock caught in Alaska is turned into surimi, a fish paste that is used to make imitation crab legs and other processed fish products. It takes roughly 667 pounds of pollock to make 100 pounds of surimi.

REGIONAL MANAGEMENT UNDER THE MAGNUSON ACT

The Magnuson Act sets forth the guidelines for the fisheries management system. The Act created eight regional fishery management councils around the country, each representing several member states with interests in the regional EEZ fisheries. Each council is composed of the Regional Director of NMFS for the area; the head of the primary fisheries management agency for each member state; and a maximum of 19 other members appointed by the Secretary of Commerce.

Following assessments and recommendations made by NMFS, designated advisory bodies, and the general public, regional fishery management councils have the authority to create and amend Fishery Management Plans (FMPs) and regulations. The councils' overarching mandate is to ensure the greatest benefit to the most people for any fisheries under their control. The Secretary of Commerce has final approval of any action undertaken by the councils; however, it is rare that a council decision is overturned.

Fishery councils are primarily composed of exactly those interests who benefit directly from increased catches: commercial fishers and other industry user groups. Notably absent is non-industry representation. There are no provisions in the Magnuson Act ensuring direct participation in the management process by other interest groups such as environmentalists, consumers, or Native Americans.

Lack of non-industry representation means the general public is, in effect, shut out of the fisheries management process. Even advisory bodies to the councils are almost entirely comprised of agency scientists, academics, lobbyists for the fishing industry, and fishers. Since industry dominates the council membership, it substantially influences the management decision-making process, yet contends that open council meetings and public hearings enable sufficient input from other groups. The fact, however, is that the councils routinely hear only one side of an issue.

Under the present council system, it is not uncommon for voting members to have a direct financial interest in the very fisheries they are overseeing. In this way, council members are permitted to vote on FMPs and other measures that could affect how much money their particular company or industry sector makes. On the North Pacific Fishery Management Council that oversees Alaska's groundfish fisheries, all seven of the members appointed by the Secretary of Commerce are representatives of the commercial fishing industry. An editorial in the Seattle Times (March 31, 1992) summed up the problem, "The regional councils that manage the fisheries are monopolized by fishermen, riddled with multi-million-dollar conflicts of interest that would not be tolerated in the landward oil or timber industries."

Greenpeace's priorities for strengthening the Magnuson Act include:

1.
Eliminating overfishing and rebuilding depleted fish populations;

2.
Requiring the fishing industry to pay more of the costs of fisheries management through mandatory and equitable fees for all sectors of the fishing industry;

3.
Minimizing bycatch and waste through direct regulations and a series of incentives and disincentives to promote the development and use of selective fishing gear and methods;

4.
Improving current monitoring and enforcement by requiring a greater level of observer coverage on all fishing boats;

5.
Abolishing conflicts of interest on the regional fishery management councils and diversifying representation to include conservation and other interests;

6.
Adopting an overall precautionary and ecosystem-based approach to fisheries management that will make conservation its primary objective.

A precautionary approach to fisheries management requires that the health of ecosystems and species be granted the benefit of the doubt, and the burden of proof be placed with the industry to demonstrate that its practices are environmentally sound, before being allowed to proceed.

A FUTURE FOR FISH

Current single species management techniques are inadequate to address the complex interactions which constitute an ecosystem. Fisheries regulations that fail to consider fully the harmful effects of bycatch on non-target species are one such example. It is no surprise that an unhealthy ecosystem cannot support a healthy, sustainable fishery. A reorganization of priorities within the fishery management system is very much required. It is easier and more ecologically sound to prevent a fisheries crash by reducing catches and mandating gear restrictions than it is to respond to a crisis after the fact, which is the current way of working.

Reactionary management mortgages the future of coastal fishing communities with serious economic consequences for all. Typically, in crises involving overfished stocks, fishing regulations become more restrictive, and overall economic impacts on the fishing industry are more severe. Additionally, fish populations that were depleted in a relatively short period of time may take several decades or more to recover. In cases where a moratorium on fishing is adopted, the period of time needed for rebuilding may aggravate the economic hardship on the fishing community. It has been estimated that New England groundfish may take at least 5 to 20 years to rebuild, and may never again be the dominant species group in the regional ecosystem.

A cornerstone of the Greenpeace approach to fisheries is the adoption of precautionary management criteria and objectives. It is simply common sense to attempt to determine the effects of what you are about to do before you do it, to ensure that the risk of damage to sensitive marine ecosystems is minimized.

A precautionary approach to fisheries means that the health of ecosystems and species must be granted the benefit of the doubt, rather than placing the burden on the environment to show signs of crises before corrective action is taken. The burden of proof must lie with the commercial fishing industry to first demonstrate that fisheries exploitation schemes are environmentally sound before being allowed to proceed.

Greenpeace recommends a precautionary, risk-averse approach to fisheries management as a first step in eliminating overfishing and rebuilding depleted populations. A precautionary approach will shift the burden of proof to the commercial fishing industry to demonstrate that fishing practices will not result in irreversible harm to the marine environment.

Greenpeace further advocates that the control of fisheries be in the hands of a broader range of affected groups and organizations. Public participation and involvement in decision-making should be increased, and the views of such groups as indigenous fishers, environmental groups and people living in affected coastal communities should be taken into account. Likewise, there should be formal public access to information gained from continuous monitoring, observation and reporting on the impacts of fishing gear types and levels of fishing effort and catch on the entire ecosystem.

The development of our national marine fisheries was fostered under the Magnuson Act to stem further overfishing by foreign fleets, and to accrue both economic and social benefits to the United States. Unfortunately, these laudable aims have been undermined by competing interests, embodied both in the Act and NMFS, of resource conservation and resource exploitation. The results are a law and an agency that are inherently contradictive, which falter in the face of scientific uncertainty, and which promote reactive rather than proactive management.

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For additional information, please consult the Greenpeace International report, "Groundfish Fisheries and the Dynamics of the Northeastern Pacific Ecosystems."

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ITQs : A Critical Appraisal

by Leith Duncan [1]

Abstract

New Zealand is not the only country to utilise an Individual Transferable Quota (ITQ) system for fisheries management, but has a more comprehensive programme than other nations and is therefore regarded by commentators as the leading exponent. As other countries consider privatising their fisheries, the New Zealand experience provides a salutory example for assessing the effectiveness of ITQs for fisheries management. This paper provides an appraisal of the workings of the New Zealand ITQ system in theory and in practice. First it outlines the history of, and current situation of the system implemented in New Zealand. Then against this backdrop, it summarises the theoretical pros and cons of ITQ systems and considers these against the Greenpeace criteria for fisheries management. The actual outcomes of implementation of the ITQ system in New Zealand are then discussed. It is concluded that, assessed with reference to Greenpeace criteria of ecosystem viability, species conservation and social justice, the ITQ system is flawed both in theory and in practice.

Fisheries management deals with conservation and catch allocation. The latter in particular involves issues of social justice. Allocation from local independent fishers to large-scale and corporate enterprises has been one clear result of ITQ management systems, a process thinly disguised as "profesionalisation", rationalisation and economic efficiency. The New Zealand ITQ system has been extremely successful for this purpose. Greenpeace criteria for fisheries management stress, by contrast, the primacy of conservation of the marine ecosystem with a proactive and precautionary approach. Management should engender cooperation rather than competition among fishers and between all the interest groups and be transparent, publically accountable and contestable. New Zealand's present ITQ system does not put conservation as the top priority. Since environmental impact assessments (EIAs) are not a prominent feature, it is not proactive nor precautionary. While, in desperation there are some signs of some cooperation amongst fishers, competition is still rife. The management system is participatory at only one level which makes it translucent at best and therefore far from accountable. Contestability is negated by the expense of taking effective action to prevent abuses.

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0. Executive Summary

0.1 The Quota Management System.

The ITQ system in New Zealand was introduced ostensibly to conserve the stocks, improve economic efficiency, and reduce government regulation. ITQs are stated as "a right to harvest a specified tonnage of the Total Allowable Catch (TAC) from a stock in a given Quota Management Area (QMA)" (Annala et al., 1989). They are, however, widely regarded as a property right to the fish. Issued in perpetuity, ITQs are freely transferable between New Zealand residents or companies with less than 20% foreign ownership. Aggregation limits restrict the quota holder from having more than 20% of the TAC for any species in a given Quota Management Area (QMA) for inshore species, or 35% for deepwater species. Quota holders must pay resource rentals to the government, and these are paid on quota held, not on catches (ibid).

0.2 Scope of the QMS.

At present (mid-1993), 32 species in some 169 management units are managed under the quota system. The supposed settlement of the Maori fisheries claims under the Treaty of Waitangi (Fisheries Claims) Settlement Act 1992, means that more species can now be brought into the quota management system (QMS). Of the further 117 species that are presently managed as non-quota species under a permit system, there are 30 that industry currently want managed by ITQs (FIB 1993).

0.3 Pressures on Quota Species.

The contest between catch levels and conservation is very stark. After seven years of ITQ management in the inshore fishery and three more in the deep water, six of New Zealand's seven major export species are in difficulty. Of those managed within the QMS, orange roughy is verging on collapse; it is only the location of new orange roughy fisheries and targetting on dwindling spawning aggregations that maintains catch rates. At the time this paper was being drafted, scientists had given notice that the "fishing down phase" for hoki has ended and the Total Allowable Commercial Catch (TACC) for this species may have to be reduced; however at the Ministry of Agriculture and Fisheries (MAF) 1993 Stock Assessment Plenary, evidence was presented of the recruitment of strong 1987 and '88 year classes, making some more optimistic. The biomass levels for the two major snapper fisheries (SNA1, SNA8) are estimated at half what is required to produce Maximium Sustainable Yield (MSY), the level of yield stipulated in leglislation; yet ironically, snapper was one of the main species that the restructuring with ITQs was intended to save. Rock lobster fisheries have been hit so severely by overfishing and poaching that quota holders are desperately seeking other ways of preventing further depletion of their fisheries. Squid is notoriously variable and may now be facing heavy predation by the increasing population of Chilean Mackerel (Ttachurus Murphii). Of the non-QMS species, greenlipped mussel has recently been hit by a toxic algal bloom, and may additionally be susceptible to land-based sources of pollution.

0.4 Conflicting Objectives in Fisheries Management.

Industry and the government are confident of doubling export earnings from fisheries by the year 2000.[2] *Although a considerable amount of "value-added" processing is possible, it is hard to see how this goal*

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[2] Bob Stannard, Chairman of the NZ Fishing Industry Board in an address to the Federation of Commercial Fishermen Conference, Nelson 1991, as reported in the *New Zealand Herald*, 24 April 1993. The goal

could be achieved except by further fishing down of at least some major species. Increasing pressure on the fish stocks is, moreover, likely to be accompanied by worsening conflicts and inequities over access to commercial catch. Such conflict has already been evident over the government's proposal – subsequently withdrawn following strong industry protest – to tender (auction) quota for new species being brought into the QMS. The tendering proposal was developed by officials as an alternative method of revenue-raising to resource rentals, as the setting and collecting of the latter is administratively complex. There is strong pressure on the government to abolish rentals and take a "one-off" rather than annual payment for privatising the fisheries. However, under a tendering system small-scale independent fishers, who have often worked hard for catch history could lose out to the larger companies which can raise the necessary finance to obtain the 'catch rights'. This would aggravate the injury to small/semi-commercial fishermen occasioned by the original introduction of the ITQ regime in the mid 1980's.

The proponents for ITQs stress economic efficiency most frequently, arguing that tradeable property rights facilitate the distribution of quota to the most efficient operators – thereby rationalising the industry and preventing overcapitalisation. Greenpeace criteria insist, by contrast, that conservation be given top priority. In this respect the most damning argument against the quota system is that, through privatising the resource, even for a limited number of species, the way is opened to capitalise all of the marine ecosystem such that its value becomes assessed primarily in terms of the market. This, it is felt, is inherently antagonistic to long-term species and ecosystem conservation interests.

0.5 Incentive Structure of the system.

At an operational level, the principal feature of the ITQ system intended to prevent overfishing, is the setting of a total allowable catch, the TAC, establishing the limit of fish that can be taken. It is also argued that, because quota is private property, the owner has an incentive to preserve the stocks in healthy and plentiful state. However, this latter proposition is questionable. The basic point is that, large or small, the operators are "driven" by a profit goal; they do not identify with the conservation goal which is imposed as a constraint against which ("rationally") they push as hard as they can. Moreover, most of them operate on a relatively short time-horizon as far as individual species are concerned, with the view of extracting as much "value" from the "ore" before it runs out or becomes unavailable. So private ownership, far from fostering an attitude of husbanding renewable but finite resources, tends to stimulate the opposite behaviour. Much of the industry appears to be in a feeding frenzy, largely interested in maximising short-term profits. With Quota Brokers adding an additional profit "layer" and non-fishing owners of quota leasing it at exhorbitant rates to fishers the conservation incentive is lost. Thus, ownership of quota doesn't in practice provide the claimed incentive to conserve. Most of the quota has been aggregated to the bigger companies more driven by this year's balance sheet, return on investment and pressure from shareholders than by concern for the longer term state of the marine ecosystem. Small scale fishers still race for fish and claim to be more competitive now than before the ITQ system was introduced.

0.6 The Setting of TACs.

The setting and enforcement of ecologically conservative TACs is the crux for both conservation and economically efficient fishing. In practice the politics of the TAC-setting process and the ethos of extractive users

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of doubling the export value of the fisheries has been reiterated several times recently; for example 25 January 1993 (FIB 1993).

are critical. It has been argued by one commentator (Gilbert, 1991) that the prevailing ethos in the industry is more concerned with maximising catch than with the optimal harvesting of a renewable but finite resource, the urge to utilise ever more powerful fishing gear, a belief that there are always new fisheries and fishing grounds to be discovered and an expectation that the government will help out if things get bad.

The TAC setting process begins with MAF scientific working groups which may include representatives of Maori (as the government's Treaty partner) and the other interests, commercial, recreational and conservation. The working groups, assess the state of the stocks and, where there is disagreement or changes to the TAC required, make recommendations to the Plenary. Greenpeace contends that the single species science used is not precautionary in that it takes insufficient account of the needs of the marine ecosystem. Following Plenary the process divides into MAF consultation with the industry at the TACC Council (exclusive), and with the other interests at the non-Commercial Users Group to which industry is invited. Confirmed minutes are exchanged between the groups. There is a final round of submissions, recomendations and consultation with the Minister of Fisheries before he sets the TACs and TACCs. These final decisions in the TAC setting process seem to be more susceptible to political lobbying from a powerful industry and Treasury than to the advice of the best science available or the concerns of conservationists. This has resulted in some TACs being set several times higher than MAF scientists recommended (e.g. Chatham Rise orange roughy in 1989 and 1990; see Cameron and Hughes, 1990). Then there are legal mechanisms, paying a surrender value for overcaught fish (deeming), trading quota for a related species (by-catch trade off), catching or fishing against another's quota (CAAQs and FAAQs), which allow quota to be exceeded. Further, illegal methods such as, discarding, high grading, overruns, poaching and the blackmarket compound the problem. For all these reasons a TAC based on the best science available may not be implemented.

0.7 Social and Economic Aspects.

There is a clear trend towards increasing industry aggregation. Currently three companies control more than 50% of the quota and there is a real fear in some quarters of growing foreign control if not actual ownership. ITQs are a transferable property right linked in various ways to the global market. The species under most severe depletion pressures are all fished for lucrative markets overseas. In this context, mechanisms such as Joint Ventures (JVs) and financing arrangements for new vessels increase the potential for overseas interests, especially transnational corporations (TNCs), to gain greater control of NZ fisheries. While small scale fishers – especially those with a strong link to particular localities, and those fishing for direct supply to local markets – may recognise their dependence on the long term health of the stocks, most of the quota has been aggregated to larger scale companies. Except in the paua and rock lobster fisheries, there are now relatively few small-scale (owner operators) with sufficient quota to be economically independent.

0.8 Compliance.

Recently the extreme extent of non-compliance and systematic evasion of fisheries management regulations has come to public attention. Transgression is widespread by both large and small operators. Given the difficult rules of evidence, the offences that come to public or even MAF attention, are almost certainly only the tip of the iceberg. Documented breaches include JV super trawlers poaching for hoki inside the 25 Nautical Mile (nm) line; a level of rock lobster poaching more than half the TACC in some areas and over one third the total New Zealand TACC; false accounting and quota busting in systematic fraud - with some companies making thousands if not millions of dollars in various scams; the allegation that in some areas 80% of the fish

on the domestic market is from the black market.[3]

0.9 Conclusion.

Clearly the ITQ system, as it presently operates, does not meet the Greenpeace criteria of a conservative, precautionary, approach to fisheries management that engenders cooperation, is transparent, accountable, or contestable. While it may be no worse than many other systems, there is, as yet, little evidence that it is any better in conservation terms. It has to be concluded that at best the ITQ system is a thoroughly ambivalent instrument for conservation. Conceptually it is premised on the assumption of "self-interest" (profit seeking) behaviour by fishing operators; and in practice it locks the surviving operators into a highly aggressive competition where legal barriers have been disregarded with apparent impunity. Moreover, the "privatisation" of catching rights is part of a larger "opening up" of national resources to transnational interests – that is, part of the capitalisation of nature and society in the interests of global capital and the transnational corporates. In New Zealand, the ITQ system has enable commercial corporate enterprise to increase dramatically their control over both the fisheries and the level of biomass extraction, with little clarity about the cumulative consequences for the long term viability of the marine ecosystem. The fact that some of these corporates are, as of recent date, part-owned by Maori shareholders, does not necessarily mitigate the risk to conservation interests posed by commercial pressures on the stock "owners".

1. INTRODUCTION

The creation of private, tradeable property rights has widely been regarded as a panacea for the problems of overfishing and overcapitalisation in open access fisheries. The New Zealand experience with Individual Transferable Quotas (ITQs), a form of property rights, suggests otherwise.

Immediately following the declaration of the 200 nautical mile Exclusive Economic Zone (EEZ) in 1983, a quota system was introduced as a way of meeting New Zealand's 'new' responsibility for management of the deepwater fisheries within this zone. Then, from that limited experience, an ITQ system was implemented three years later (in 1985/86) for the inshore fisheries, to reduce effort and

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[3] On hoki, see Chris Linton, Senior Fisheries Investigation officer, quoted in *NZ Herald*, 2 September 1992. On rock lobster, see news items in the *NZ Herald* 6 October 1991; *Sunday Star*, 6 October 1991; *Dominion Sunday Times*, 4 August 1991. The probable scale of fraud is as estimated by Bruce Shallard, MAF Director of Operations, quoted in *Dominion Sunday Times*, 4 August 1991. On the extent of the black market, see the Hon. Doug Kidd, The Minister of Fisheries, Media Statement, 17 February 1992; and also, Barry Nalder, MAF Tauranga District Compliance Manager, quoted in connection with Operation Buster, *NZ Herald* 18 February 1992.

prevent further overfishing. These systems for the deepwater and inshore fisheries were quickly amalgamated.

New Zealand is not the only country to utilise such a Quota management System (QMS), but has done so more comprehensively than most other nations and is therefore regarded by many commentators as the leading exponent. As other countries are now considering privatising their fisheries in this way the New Zealand experience provides a salutory example for assessing the effectiveness of ITQs for fisheries management. This paper provides an appraisal of the workings of the New Zealand ITQ system in theory and in practice. *Section 2* outlines some elements of the history of, and current situation of, the system that has been implemented in New Zealand. Then against this backdrop, *Section 3* summarises the theoretical pros and cons of ITQ systems and considers these against the Greenpeace criteria for fisheries management. *Section 4* looks at the actual outcomes of implementation of the ITQ system in New Zealand. *Section 5* concludes that, when assessed with reference to Greenpeace criteria for fisheries management – to sustain fish stocks, and to ensure ecosystem viability, species conservation, and social justice – the ITQ system is flawed both in theory and in practice.

The New Zealand Fisheries Act is currently being reviewed, and consequently there is considerable debate over various issues of ITQ management. The whole situation is in a state of flux with uncertain outcome. While this paper is concerned most with reviewing the history and development of the system to date, obviously the issues discussed have a bearing on possible future directions for the system and its reform.[4] Fisheries management deals with conservation and catch allocation, issues that are inextricably linked to – and finally become – matters of social justice. Who gets the fish depends on how much, if any is conserved over the time period in question. Those who suffer injustice may poach and pirate, plundering the stocks and hindering conservation. The conservation problem may be compounded as commercial incentives can be such that those with legitimate access may also overfish. "Power, conservation and poverty don't mix" (Bonilla, 1992). Reallocation of catch entitlements away from local, independent fishers to large-scale and corporate enterprises is a direct consequence of the ITQ management system, a process thinly disguised as the "profesionalisation", rationalisation, and improvement of economic efficiency in the industry. The social conflicts resulting from these shifts in economic opportunity, compounded by the questions of Treaty of Waitangi guarantees and non-commercial catch, are likely to remain key points of contention in the future operation of the QMS.

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[4] The Greenpeace Wave Making Fisheries Tour, during October/November 1992, was undertaken to raise public awareness of the New Zealand Fisheries Act Review. It involved 20 public meetings, all but two in the main and regional fishing ports around New Zealand. Commercial fishers attended most of the meetings, asked questions and expressed their concerns, and many others were interviewed by the writer during the tour, as opportunity, circumstances and a tight schedule would allow.

2. DESCRIPTION OF NEW ZEALAND'S ITQ SYSTEM

2.1 *The Quota Concept.*

ITQs are stated officially as "a right to harvest a specified tonnage of the TAC from a stock in a given Quota Management Area" (Annala et al. 1989; see also Clark and Duncan 1986). They are widely regarded by users as constituting a property right to the fish they represent. This is understandable as, in legal terms, ITQs are issued in perpetuity and are freely transferable between New Zealand residents or companies with less than 20% foreign ownership. Quota holders must pay resource rentals to the government, and these are paid on quota held, not on actual catches. There are aggregation limits that restrict the quota holder from having more than 20% of the TAC for any species in a given Quota Management Area (QMA) for inshore species, or 35% for deepwater species, with the exception of a few species that were "grandfathered" at the initial allocation of ITQs. So the ITQs can be traded as a "capital" in much the same way as many other company assets.

At present 32 species across some 169 management units[5] are in the system. The legal settlement of the Maori fisheries claims under the Treaty of Waitangi – the Sealord Deal – means that it is now politically feasible for the additional 117 species that are presently managed as non-quota species under a permit system, to be brought into the QMS.[6] Of these, the fishing industry wants 30 brought under quota control in the immediate future (FIB,1993).

Setting resource rentals is administratively complex, and there has been strong pressure from the fishing industry for the government to abolish rentals. In 1992 the proposal was made by MAF officials that, instead of rentals, a return for what amounts to the privatising of a public resource could be obtained through a one-off tendering (auctioning) of the quota rights for these fisheries. This proposal provoked a storm of protests. Amongst other things, it was feared by small-scale independent fishers, who have in many cases worked hard for catch history, that they would lose out to the larger companies which can raise the necessary finance to tender up-front for quota. At the time this paper was written, the Minister of Fisheries has (following strong representations from the industry) backed away from the tendering plan, and stated that catch histories will be used in

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[5] The New Zealand EEZ is divided into 10 QMAs. Quota for each species are managed within these areas, or combinations of them. Where it is known that stocks of the same species can be separated, this is taken into account. There are, however, some glaring anomalies – the Oreos, for example, where three separate species are treated as one.

[6] Comprehensive treatment of the Maori role in New Zealand fisheries, particularly in relation to the ITQ system, is beyond the scope of this paper. See Walker (1992) for a brief history. Briefly, many Maori fishers were among the part-time and small-scale fishers excluded at the introduction of the ITQ system. Maoris believed that the exclusive property rights aspect of the ITQ system was contrary to their fishery rights under Article 2 of the Treaty of Waitangi. The Muriwhenua, Ngai Tahu and other claims were taken to the Waitangi Tribunal on this basis, and other court actions were also taken during the latter 1980s. This resulted in a successful High Court injunction on the progressive expansion to bring more species under the Quota Management System (QMS). Although subsequent agreement did allow the inclusion of four more species (squid, jack mackerel, rock lobster and southern scallops), it generally prevented others being brought in.

allocating new species' quota. The final solution is still under discussion, and the place of resource rentals remains under debate.

2.2 *Recent Trends in the New Zealand Fishery.*

During the 1960s and 1970s, New Zealand commercial fishing expanded dramatically, with the development of export markets especially to Austalia, Japan, and the USA. This period was marked by the declaration in 1978 of the 200nm Exclusive Economic Zone (EEZ), the introduction of sophisticated vessels and new fishing technology, and the beginnings of systematic exploitation of the deepwater fisheries (see Clark, Major & Mollet 1988; Cullen & Memon 1990). Prior to this the industry was mainly supplying the domestic market with prime inshore species such as snapper (Chrysophrys auratus), groper (Polyprion oxygeneios), tarakihi (Nemadactylus macropterus), trevalli (Psydocaranx dentex), gurnard (Chelidonichthys kumu) and rock lobster (Jasus edwardsii).

Before the international ratification of the EEZ concept in the late seventies, the deepwater species -- particularly orange roughy (Hoplostethus atlanticus), hoki (Macruronus novaezelandiae), tuna (Thunnus maccoyii, T. albacares) and squid (Nototodarus gouldi, N. sloanii) but also the oreo dories (Allocyttus niger, Pseudocyttus maculatus, Neocyttus rhomboidalis) and southern blue whiting ((Micromesistius australis) -- were fished mainly by foreign nations, principally the USSR, Japan, Korea, and Taiwan. Fishing methods were mainly trawlers but also longliners and squid jiggers, and later the USA super-seining for tuna. With the declaration of the EEZ, the government initially entered bilateral agreements (Foreign Ventures: FVs) with these foreign nations. The large New Zealand companies, however, lured by visions of a lucrative virgin resource, became interested in these species. The formation of Joint Ventures (JVs) was encouraged by the government, and this in due course led to the phasing out of all the FVs with the exception of a comparatively small amount of long-lining for tuna and billfish.

The QMS system was introduced in 1983 for deepwater, and in 1986 for inshore species. Prior to this, the domestic inshore fisheries operated from all the ports around the coast, with Auckland the largest. As quota was aggregated to the larger companies under the ITQ system, operations have tended to become consolidated in the largest ports, reducing the fleets in the smaller. Following the development of the deepwater fisheries Nelson has become the largest fishing port in the country.

In 1962 commercial wetfish and rock lobster landings were estimated at 27,733 tonnes and 4,501 tonnes, valued at $NZ 3.5 and $NZ 2.2 million respectively (Watkinson and Smith 1972). By 1992 the volume of New Zealand's seafood production from within the EEZ had risen to nearly 595,000 tonnes worth about $NZ 1.1 billion (FIB, 1992).

2.3 *Origins of the ITQ System.*

Ian Clark and Phillip Major who were senior officers in MAF Policy when the inshore ITQ system was introduced in 1986, are widely identified as principal architects of New Zealand's system

(Neher et al. 1988). In a 1988 retrospective discussion (Clark, Major and Mollet 1988, p.113), these officers explain that:

> *"The Law of the Sea, giving recognition to coastal state's rights to fish stocks and the declaration in 1978 of NZ's EEZ, were prerequisites for ITQs, but the state of the NZ economy with high inflation rates, a downturn in international markets for agricultural products, foreign trade barriers and protectionist policies in the context of the worldwide rural recession, were as important."*

Also, however, a strong impetus for the restructuring of the coastal fishery, came from the persistent lobbying of the Federation of Commercial Fishermen, mainly owner/operators, who believed that the only way to save the inshore stocks was a 40% reduction of fishing effort in the coastal fisheries. They had experienced a succession of boom and bust fisheries, notably the Chatham Island rock lobster bonanza and crash in the 60s; the scollop fisheries; the snapper fisheries of the Hauraki Gulf, Golden Bay and elsewhere in the early 70s; Bay of Plenty trevalli; the progressive depletion of the gropers and the elasmobrachs. In each case these fisheries had been driven to collapse or serious depletion and fishers were still coping with the consequences. They wanted management that would provide stable long term, profitable fisheries.

Fishermen were living with the outcome of the succession of policy structures that had been implemented over the preceding decades. The regulatory interventionist policies of the 1908 Fisheries Act aimed at biological protection. Then the restrictive licencing system from 1938-1963 involved extensive gear and area controls, and required boats to fish from nominated ports. In 1963, the inshore fishery was greatly deregulated, and during this period of "open access" the government's policy was to encourage investment in the fishing industry through investment incentives, capital grants, allowances and tax breaks (Clark, Major and Mollet 1988, p.127). Many fishers had experienced, for better and for worse, the consequences of the resulting rapid expansion and overcapitalisation of the domestic fishery. In 1978 there was a moratorium placed on issuing new permits for rock lobster and scallops; then, two years later, this was extended to wet fish permits as well. A number of separate Controlled Fisheries (limited entry) were tried for rock lobster and also for snapper in the Hauraki Gulf; but these had resulted in increasing effort not in the rebuilding of stocks (ibid.).

These different phases in the history of New Zealand's fishery management had included most of the legal and administrative mechanisms for fisheries management familiar in the modern English speaking world. The fishers knew of the ups and downs of all the regimes -- including limited entry and input controls -- and in many cases had experienced them first hand; and they knew these various approaches had failed. So in order to save their fisheries they were ready to consider innovative approaches. Clark and Major make clear, however, that the particular thrust of the 1980s reform was dictated by a specific economic agenda. It was, they assert (ibid.), the "government's declared intention to bring market forces to bear in .... fishery management;" and this is the agenda that led to ITQs.

A significant discrepancy is apparent between the motivations of the fishers towards conservation of the stocks but including economic self-interest, and this early expression of market-driven New Right objectives of MAF Policy. ITQs were implemented in 1983-86 to address overfishing, overcapitalisation, and excessive government regulation (cf. Sissenwine and Mace 1992). So the stated objectives were, simultaneously: conservation, economic rationalisation, and reduction of government interference. Clearly social justice was not an objective, and indeed it suffered in the process.

In 1983 the Deepwater Trawl policy was implemented "based on company allocations or quota rights to catch specific quantities of fish" (MacIntyre 1982). This followed management practices of the Canadian east coast deepwater trawl industry. Allocations of quota for seven species were made to the nine biggest NZ fishing companies on the basis of deepwater catch processed ashore and level of investment in processing plant and large (20+ metres) vessels (ibid., pp.28-29). This was consistent with directions in government policy from the late 1970s for development of the deepwater fisheries. The government had been quite deliberate in promoting joint ventures to enable domestic firms to acquire technology and expertise, knowledge of and access to international markets, significant volumes of fish for shore processing plants and time to assess the economics of the deepwater without the initial capital to purchase large vessels (MacIntyre). Furthermore, although most of the big companies had joint ventures, there was also much talk of "New Zealandisation" of the deepwater fishery. The deepwater quota allocations were seen as a move in that direction.

Inshore fisheries posed more complex issues. In 1983 the National Fisheries Management Advisory Council (NAFMAC) was formed with representatives from MAF policy, research, Industry and the Federation. They produced a discussion document on "Future Options for the Inshore Fishery" which attempted to present the state of the main commercial species and fishing activity by region. In the consultations that followed, fishermen were very critical of the detailed analysis, particularly as it pertained to their own main species and ports. But the report did provide the best overview then available of both the biological and economic status of the coastal fishery.

At the consultative meetings around the country, fishers were handed the document at the door. It was clear even then, that fishers were being told what would happen rather than being asked for their views.[7] They could see clearly that, although options were ostensibly being offered, the steer toward ITQs was very strong. The moratorium on new entrants to the industry (the Limited Entry policy) and effort controls, had both already proven ineffective; and fishers hadn't liked their past experiences of controlled fisheries (with tighter limited entry). Compensation based effort-reduction schemes (Buy-backs) were widely favoured amongst fishers themselves; but a government facing serious balance of payments problems probably wouldn't fund them, the necessary levies on remaining fishers would render them uneconomic, and the overall effectiveness of such a scheme was uncertain. Fisheries Management Plans (FMPs) also were felt to have some attractive features, but

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[7] This opinion is confirmed in the personal experience of the writer, from attending Auckland and Wellington meetings.

insufficient supporting information was provided to allow serious consideration.[8] The NAFMAC's final Report to the Minister of Fisheries concluded that "an overfishing and overcapitalisation problem of some magnitude exists in the inshore fishery," and that fishermen "expressed interest" in ITQs within a Fishery Management Plan (FMP) framework but "were skeptical of Management's ability to prevent non-aggregation and to manage individual quotas" (Belgrave, no date, circa 1984).

One very significant table in the NAFMAC discussion document had indicated that a mere 50 vessels, being 1.3% of the fleet by number of boats, had landed 45.2% of the annual catch; while at the other end of the scale, the last 2,500 vessels in a total of 3,928 had accounted for just 4.6% of the catch. Clearly these 50 vessels were the largest trawlers, operated by the big companies. These same companies were already working in the deep water. If the real intention had been to reduce fishing effort by 40% on the inshore fishery, then perhaps this is where reduction should have started![9] Although most of these 50 large vessels were still too small for ideal deepwater operation,[10] the companies running them had access to the global capital markets and could have traded these for more suitable vessels for a shift into the deepwater.

However, MAF's first step in restructuring, ostensibly to achieve a 40% effort reduction, was to "professionalise" the fishery by eliminating the "part timers". In some cases this was inoffensive, where, for example, insurance company managers or teachers were fishing during their holidays. In other cases, of Maori especially from numerous small ports and communities, and of both Maori and Pakeha (non-Maori New Zealander) seasonal workers in the meat and forestry industries, as well as subsistence or so-called "lifestyle" fishers, it aggravated levels of unemployment that were already high, disrupted a major source of livelihood in many coastal communities, and created major social and economic hardship. Meanwhile the real part-timers – corporates such as Fletchers and Carter Holt Harvey (CHH) that had their primary activities in other domains such as construction, forestry, pulp and paper – finished up with most of the quota.[11]

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[8] Subsequently, there was extensive work on two Fisheries Management Plans (for the Auckland and Central areas), including high levels of public input (900 submission to the proposed Auckland FMP). But the concept has largely been scrapped by MAF – ostensibly as too expensive and complex, but perhaps really because there was too much public input for industry's liking.

[9] This suggestion does, of course, beg the questions of the relative economic efficiency of the large and the small operators, of the relative incentives to stock conservation amongst large and small operators, and of the (in)stability of the status quo industry structure if the large operators had been forcibly exited. These questions cannot be answered retrospectively; the point is that they were never asked at the time.

[10] The largest among these were those known as "100 footers" (about 30 metres).

[11] In 1979 Fletcher Challenge, a conglomerate involved mainly in engineering, timber, building and construction, was quick to realise the potential of the deepwater fishery and formed a subsidary company, Fletcher Fishing Limited. As its initial endeavour, Fletcher Fishing embarked on a joint venture with a Soviet group, Sovrybflot. In a move designed to strengthen Fletcher Fishing's experience in the industry as a whole, in 1981 they merged with Wrightson Fisheries who had a fishing history throughout New Zealand with substantial operations for rock lobster and finfish dating back to the 1930's (Mark Davison, pers. com. 1990). Even so, during the early 1980s Fletchers along with Carter Holt Harvey (a similar conglomerate, with such large-scale operations in other fields) were seen by small-scale fishers as "Johnny-come-latelies", opportunistically part-timing in the fisheries.

In the industry restructuring that followed, no formal provision was made for crew members. Many of the small units were two-man operations, frequently long term partnerships. The catch history accrued to the owner/skipper who gained the value of the asset involved. Where this was tendered in the buy-backs, crew often lost their jobs -- without any formal compensation. This was a major injustice that continues to be overlooked. It also made it much more difficult for crew wanting to become owner operators. Not only did they have to raise the finance for the vessel but as much or more again for quota. As one commentator has put it (O'Connor 1993, p.29):

> *"The 1980s management procedure was to commodify access to the fish species most under threat, in form of catch 'quota,' then to award these rights to the major commercial operators as a free gift, in proportion to their documented catch histories. The small-scale and 'informal' operators, and the local people who thought they enjoyed an environmental domain as a collective heritage and source of sustenance, were told that they do not 'own' it at all. Effectively, ownership (all commercial catch rights) was awarded to the large commercial operators who, from the Maori/local points of view, were the original 'poachers' overfishing the stock."*

2.4 *Introduction of the QMS.*

New Zealand's Quota Management System (QMS), introduced 1 October 1986, began with stock assessments of all the stocks to be managed. Total Allowable Catches (TACs) were set based on estimates of Maximium Sustainable Yield (MSY), as adjusted with consideration of economic, environmental and social factors. In making these MSY estimates, two methods were used, fishers' catch histories and MAF trawl surveys. The former were probably optimistic, being inflated by the fact that fishers had been intensively fishing for catch history. (This was the so-called "dartboard" process; estimates based on very uncertain information). Trawl surveys, on the other hand, possibly underestimated the species biomass due to conservative assumptions about vulnerability to gear. [12]

Provisional allocations to fishers were then made, based on the average catch during the best two of the last three fishing years. Since many of the sums of catch histories (SCH for each species-area) exceeded the set TACs, there was a government buyback ($NZ 42.4 million) to facilitate an "orderly" rationalisation of the industry. After two tender rounds (an auction system) where sufficient quota was not tendered, pro rata cuts were made. As things turned out, about 1400 of the 1800 fishermen involved appealed their allocation (Sissenwine and Mace 1992). Permitted grounds for appeal included, inter alia, unreported catch (Annala et al. 1989). Resolution of these and subsequent appeals has only just been completed, and the outcomes have, in some cases, negated the quota reductions made when the system was introduced. for example, with snapper in Quota Management

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12 See Sissenwine and Mace (1992) for amplification on these points; also Clark and Duncan (1986) for another description of the ITQ system and the procedures of its introduction.

Area 1 (SNA1), a 1,222.4 tonne increase in annual TACC following appeals, has resulted in the TACC being set at nearly 6000 tonnes annually, being approximately 110 tonnes higher than the pre-ITQ 1984-85 level of 5876 tonnes. Consequently, in overall result "the buyback may have had relatively little effect on fishing mortality rates" (Sissenwine and Mace 1992).

2.5 *The Change to Proportional Quota.*

The ITQ scheme as initially introduced awarded catch quota by the tonne for the designated species and area. However, implementing absolute quotas turned out to be a major management mistake. At the time, fisheries managers and the industry believed (or, at least, asserted) that the initial TACs were very conservative and that therefore there would be little, if any, need to buy back quota to achieve future TAC reductions. Rather it was anticipated that, in the future, more quota for selected species and areas could be sold, thus benefitting government revenue. It was, in these regards, widely held that the system as implemented was "risk averse" and prudent. But in fact it was "risk prone", and still too liberal in relation to stock sizes. In particular, serious mistakes had been made in aging orange roughy, as the species was radically different from previous experience; and over-optimistic use made of acoustic surveys on hoki (Sissenwine, pers. com., 30 March 1993).

So by the late 1980s there was need, if fishing-out was to be avoided, to make drastic cuts to some TACs, especially for orange roughy and hoki. This led to negotiation of "The Accord" between the government and the fishing industry, which became the Fisheries Amendment Act 1990. It meant that instead of the Crown buying back the quota at very considerable cost to reduce the TAC, the industry would henceforth take pro-rata reductions to quota holdings. Then, when and if fish stocks rebuilt, instead of the government tendering new quota, any increases in TAC would be allocated on a pro-rata basis. To get industry agreement to a change in their previous rights, the legislation provides a transitional period in which industry can (effectively) keep resource rentals as compensation for any reductions that do occur (Ministerial Briefing: Fisheries 1990).

Essentially this transferred the risk of depletions from the government to the industry. In exchange government has provided, in effect, about $NZ 200 million in "compensation" at a time when subsidies have been lifted from all other industries.[13]

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[13] Since industry activity contributed significantly to the serious depletions of the roughy stocks it is difficult to accept the validity of this "compensation". As far back as 1983 industry had been warned of the uncertainties in the orange roughy fishery (Taylor and Baird 1983), yet industry had continued to expand its infrastructure and markets, to fish in a profligate manner, and to exert pressure to maintain high TACs even after the collapse of the Challenger Plateau stock. Loss of fish due to burst bags in the early stages of the learning curve during fishing on spawning aggregations are deplored but excusable due to inexperience. But that the following sort of incident occurred at any stage is totally inexcusable: "A MAFFish scientist onboard a vessel in the vicinity of the fishing activity on the Chatham Rise said that the large trawlers had staked out their trawl path and continued fishing until they had depleted that area. If the previous catch had not been fully processed by the time it was ready to shoot the net again, the surplus catch was dumped. This was done so the trawler did not lose its position on the aggregation of fish. The scientist said the sea was a mass of red (bloated carcasses of orange roughy" (Mark Davison, pers. com. 1990). There are other anecdotal accounts – but from less verifiable sources – of large amounts of roughy being dumped more recently in the Chatham Rise and Cook Canyon fisheries (pers. com., Fisheries Tour 1992). In 1990, as a Greenpeace Observer the author witnessed possibly the

Now after seven years of ITQ management in the inshore fishery and ten in the deep water, five of New Zealand's seven major export species (hoki, orange roughy, snapper, rock lobster, paua, squid and green-lipped mussel) are in strife. The first four of these are managed under the QMS. Orange roughy is verging on collapse; it is only the location of new fisheries for orange roughy and targetting on dwindling spawning aggregations that maintains catch rates. Last year scientists gave notice that the "fishing down phase" for hoki has ended and the TACC may have to be reduced; however this year (May 1993) at the MAF Stock Assessment Plenary, with recruitment of the strong 1987 and 1988 year classes, they were more confident. The biomasses for the major snapper fisheries (SNA1 & SNA8) are estimated as being about half that required to produce Maximium Sustainable Yield (MSY), the level stipulated by leglislation. Ironically, this was the major species that the ITQ system was intended to save. Rock lobster fisheries have been so hit by overfishing and poaching that quota holders are desperately seeking other ways of preventing further depletion of their fisheries (information from 1992, 1993 TAC setting processes, and personal communications during the Fisheries Tour 1992). Clearly the restructuring and management with ITQs has not prevented serious overfishing for any of these species.

Outside the QMS, paua fishers are finding themselves in a similar situation to that of rock lobster fishers. Squid catch is notoriously variable and, according to industry, is also threatened by additional predation by what they believe is an encroaching, rapidly expanding, population of Chilean jack mackerel (T. murphyi). Greenlipped mussel has just been hit (in the summer of 1992/93) by a nationwide toxic algal bloom with the resulting bans on harvesting and both domestic and export marketing.[14] While the industry may recover from this set-back, events such

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earliest commercial exploratory fishing for orange roughy in the Pusyger Area. The vessel found two pinnacles with orange roughy and oreo dory. It trawled both pinnacles until it could get no more fish, trawling right to the deadline for the end of the trip. The skipper asserted, however, that there would be more fish on those pinnacles in a month's time. Fishers have seen the Challenger fishery collapse and the north Chatham Rise depleted and still the ITQ system is ineffectual for preventing the process continuing for the entire roughy stock.

[14] For a scientific overview, see Jaap A. Jasperse (ed. 1993), the proceedings of a June 1993 research workshop on marine toxins in New Zealand shellfish". The severity of this event both economically and symbolically, is indicated by the news coverage it received. From the first closures of beaches and commercial shellfish farms to gathering, harvesting, processing, marketing and export of shellfish and paua in early January 1993 until mid-April when only a few closures remained, the toxic algal bloom was initially reported almost daily in the newspaper, radio and TV news bulletins. See for example, in the *New Zealand Herald:* "Bloom stops exports", 7 January; "US ban on shellfish", "Shellfish ban hits farmers", 12 January; "Three-week ban for poison algal sites", 13 January; "East coast shellfish off limits" 14 January; "Workers hit by ban must wait for dole", "Maoris take scare with a pinch of salt", 15 January; "Alga main suspect in toxin hunt", 16 January; "Chilly ocean gets blame for poisoning", "Bid to save shellfish from extinction", 19 January; "Toxins threat to fish industry says scientist", 29 January; "Blooms still have boffins guessing", "Prime toxin suspect unmasked" 3 February; "Sealife deaths deepen alarm" 6 February; "Algal bloom blamed for dead shellfish", 8 February; "Tests raise hopes for end to shellfish crisis", "Blooms blamed for lost kelp", 9 February; "Ministry may keep up algae checks", "Paua flesh clear", 11 February; "Shellfish to pass all tests", "Toxic bloom", "Shellfish from five zones still toxic", 13 February; "New find could end shellfish ban soon", 26 February; "Southern shellfish cleared to eat", 6 March; "Algae toxins in the wind", 12 March; "Export firms 'flat out' on shellfish", "Toxin remains", 13 March; "Invasion of the shellfish toxins", 17 April [Full page review]; "Shellfish clear", 25 May.

The *NZ Professional Fisherman* also carried follow-up articles, for example: June Joyce, "Crisis - Communications," March 1993; Ruth P. Baldwin, "A Matter of Concern" [reprinting of an article titled "Cargo vessel ballast water as a vector for the spread of toxic phytoplankton species to New Zealand" appearing in the

as these show the vulnerability of our inshore fisheries to ecological factors. Aquaculture is, in general, very susceptible to land-based sources of pollution. Recent reports referring to the tremendous number of potentially hazardous toxic waste disposal sites – including some 800 accidental or deliberate disposal sites for timber treatment anti-sap stain containing PCPs around the country (Jackman 1992) – highlight the severity of these risks.

Despite all these difficulties, the industry and the government are confident in the future expansion of the fisheries. Last year the industry topped $NZ 1 billion in earnings for the first time. Both industry and the government aim to double that by the year 2000. The "Big Three" companies have each recently bought large hi-tech vessels, displaced surplus from collapsed or depleted northern hemisphere fisheries.[15] As he renamed two of them the Minister of Fisheries expressed the unconstrained exuberance of the present ethos: "$25 million dollars worth of new investment will create 200 more jobs and generate export earnings in excess of $NZ 15 million per year. New Zealandisation at work" (Doug Kidd, 22 December 1992).

3. PROS AND CONS OF ITQS

The most unequivocal published recent statement on the New Zealand ITQ system was made by a MAF official in the Ministerial Briefing Papers for the incoming National Party government in 1990. "This is the most advanced fisheries management system in the world, and NZ is the first to make the system work in practice". The particular claim was made (ibid.) that the system not only contributes to conservation goals, but also to economic ones in that: (i) it preserves economic benefit in that extra profits (resource rents) aren't dissipated by overfishing; (ii) it promotes investment in fish stock through reductions in catches because as stocks are rebuilt less effort is required; (iii) it promotes stability by helping to avoid boom and bust cycles; and (iv) it promotes cooperation within

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Journal of the Royal Society of New Zealand, Vol.22, No.4, December 1992, pp.229-242, with the stipulation that it was not purporting to explain nor infer a connection with the current toxic algal bloom – that was for future scientific evaluation]; Alistair MacFarlane, "Marine Biotoxins and Shellfish: or Lessons in Managing Environmental Risk", May 1993; and "Shellfish Recovery Trust", May 1993.

Continued monitoring through the second half of 1993 led to subsequent reclosures on a district by district basis, especially in some parts of the North East coast. What is hoped to be the final all-clear was given on 8 December 1993 (*New Zealand Herald*).

[15] These vessels were bought from Norway, Canada, and the Faeroes (see the *NZ Professional Fisherman*, December 1992, February 1993; and *Fishing News International*, March 1993, p.60). This echoes the precedent set early in New Zealand's deepwater fishery, with the purchase of a number of laid up British distant-water vessels. In recent years, collapse of the cod stocks and depletion in haddock, whiting and other fisheries has resulted in considerable overcapacity in the distant water fleets of Northern Hemisphere fishing nations. It seems no coincidence that at least two delegations – Royal Greenland, and the Shetland Isles fish marketing company Framgord – were prospecting in New Zealand early in 1993. The former sought Southern Ocean fisheries for their fleets, joint ventures with New Zealand companies for product, were part of a consortium offering to buy Sealord Fisheries, and were actively brokering vessels (*NZ Herald*, 6 March). The latter was fostering present joint ventures and seeking further product (*NZ Herald*, 5 March 1993).

the industry. The proponents of ITQ systems thus argue that through a variety of mechanisms ITQs promote economic efficiency. In particular:

1. they eliminate important external diseconomies;
2. they are useful for the generation of rents;
3. they help to rationalise fleets;
4. they provide a framework by which quota will tend to go to the most efficient operators;
5. security of rights and future benefits provides incentives for management of the fisheries by the industry itself, including the change of fishers' attitudes toward more cooperation for better management and information collecting.[16]

Achieving the simultaneous objective of long-term species conservation depends on the setting of TACs at sufficiently modest levels, and on the assumption that individual quota will reduce the "race for fish". Mace (pers. com., 26 March 1993) claims that the ITQ system was supposed to provide economic incentives for fishers to be concerned for the long term health of the stocks; and many other writers espousing the theoretical merits of the scheme have postulated similar benefits. However, all this supposes effective enforcement. The further argument that if fishers have property rights they will be self policing, while barely mentioned in the published literature, was put very strongly during the introduction of the ITQ system in NZ, and is again being strongly promoted in the media and the fishing industry's journal *Seafood New Zealand* (see the December 1993 issue). The idea is that poachers and "burglers" will be seen as encroaching on the assets and rights of the fishers, who thus will see it as in their interests to enforce the regulations and safeguard their assets. Similarly it was argued that they would exert peer pressure directly on their peers to comply with regulations, or would draw offending to the attention of the authorities. (However, fishers have argued since that they cannot, in fact, "dob in" (inform on) other fishers because they are mutually dependent on them for safety and assistance.)

There are not many papers in the academic literature that consider the negative aspects of ITQs. Two, however, stand out for their attempts at critical evaluation: a journal article by Copes (1986) pitched at a general and theoretical level; and a discussion by Sissenwine and Mace (1992) that deals specifically with the ITQ system implemented in NZ. A third paper, by MAF fisheries scientists Annala, Sullivan and Hore (1989), deals with the problems with ITQs that arise from multispecies aspects of New Zealand's fisheries. A variety of non-published government reports and of comments, appraisals and submissions from non-academic sources, identify a range of issues from both conceptual and practical points of view. The following paragraphs summarise the issues as raised by these commentators.

* Copes (1986), while stating that his inventory is not exhaustive, lists the following problems that may arise: (1) Quota busting; (2) Data fouling; (3) Residual Catch Management; (4)

[16] These points are a distillation from varied sources, including Molony and Pearse (1979); Copes (1986); Arnason (1991); Dewees (1989); Pearse (1991); Pearse & Walters (1992).

Unstable Stocks; (5) Short Lived Species; (6) Flash Fisheries; (7) Real Time Management; (8) High Grading; (9) Multi-Species Fisheries; (10) Seasonal Variations; (11) Spatial Distribution of Effort; (12) TAC Setting; (13) Transitional Gains Trap; and (14) Industry Acceptance. Of these quota busting, data fouling, high grading, multispecies fisheries, spatial distribution of effort, TAC setting, and the transitional gains trap are particularly pertinent for New Zealand.

* Sissenwine and Mace (1992) argue that ITQs were introduced in NZ for reasons of conservation, economic efficiency and to reduce government regulation. Their damming critique concludes that none of these goals have been realised.

* Annala, Sullivan and Hore (1986) present the main problems with ITQs as: (1) Discarding; (2) Highgrading; (3) TAC overruns; and (4) TAC Underruns. The solutions to these problems are presented as: (1) Trading ITQ between fishers [quota holders]; (2) Fishing or catching on behalf of another quota-holder (FAAQs and CAAQs); (3) Overcatch allowance of 10% or carry-over of 10% to following year [the 10% overs and unders]; (4) Surrender of overcatch to Crown for nominal payment [the deemed value]; (5) Exchange of uncaught ITQ of certain species for catch of another overcaught species) [bycatch tradeoff].

These sorts of concerns may be set in institutional perspective by noting that in 1991, Peter Pearse, who has been a key figure in developing the concept of ITQs internationally, was brought to New Zealand by the Crown as a consultant to initiate the Review of NZ Fisheries Leglislation. In his paper (Pearse 1991) to initiate a round of public discussion he indicated the difficulties with the ITQ system in the following terms:

> *"Since its introduction the quota management system has given rise to a variety of problems and controversies over such things as adjustments in the total allowable catch, incidental catches (or by-catches) of non-target species, rental payments for quota holdings, enforcement and other issues."*

His general assessment notwithstanding these difficulties, was that the quota system is a better way of managing fisheries than other options, and should be retained. Changes are, however, urgently needed to make the system work better; those who hold rights to fish should have more responsibility for managing them; and environmental concerns are not well handled (ibid). However, it is far from obvious that tinkering with the existing system will be adequate to resolve the ecological, social and economic issues that have arisen.

Economic efficiency is the feature that is stressed most frequently by proponents of ITQs. The right to take a specific quantity of fish eliminates, so the argument goes, the incentive to increase fishing power for competitive reasons and therefore tends to mitigate against overcapitalisation. Transferability of that right means that the more efficient operators have the financial ability to gain

needed quota, thus enabling inefficient operators to sell-out which leads to the economic rationalisation of the fishery.

Against this sort of legitimation of ITQs, a number of points should be made clear. First, that the efficiency goal is, even in theory, achieved only if the catch level is set right, and effectively enforced. Second, that achieving economic efficiency does not necessarily coincide with objectives of conservation and sustainability. Indeed, unless long-run sustainability is provided for in political terms by stating instrinsic value and "rights" of future generations of fishers, and in management terms by setting catch limits that permit ongoing stock regeneration, there may be direct conflict between economic efficiency and ecologically sustained fisheries. Third, that in privatising the resource, even for a limited number of species, the way is opened to capitalise all of the marine ecosystem such that its value becomes assessed primarily in terms of the market. Defining the fisheries as a commodity means that resistance to its sale is very difficult. Once property rights have been issued the situation is irreversible. The market assumptions are inconsistent with long term ecologically sustainable management, intrinsic value or the interests of future generations (O'Connor, 1993). Commodifying the fisheries also tends to dispossess small scale and independent fishers, and local people – as it certainly did in New Zealand – so clearly ITQs need not accord with concerns for social justice.

These are not abstract or hypothetical concerns. For example, at the time of introduction of the inshore ITQ system, local small-scale fishermen based on Waiheke Island were critical of the system as being a gross invasion of their civil liberties, a system for collecting government revenue that would lead to the larger companies taking over the fisheries (Gulf News, 1986). Their worries have, in many respects, been shown justified by the increasing industry concentration. Furthermore, it is clear that, in some fisheries at least, neither economically efficient levels of effort nor long-run sustainability is being provided for. The Ministerial Briefing (1990) on fisheries, while generally lauding the QMS, noted that there were some difficulties for management with this system:

> *"resource rentals never fully captured the value of quota, and market prices remained at high levels. The high quota prices, in turn made it prohibitively expensive for the Crown to manage the resource. If the Government wanted to reduce the TAC for conservation reasons it would have to buy quota from the industry at high prices. It was therefore faced with an enormous bill which could not be recovered from the industry."*

The Briefing report also admits that industry has taken a very activist stance since ITQs were introduced – for example, that it takes an strong and increasing interest in the setting of TACs, and has opposed many proportional reductions in TACs. Also, because of its "property right" – or, at any rate, pecuniary interest – industry increasingly demands consultation before any changes are considered by government. Contract scientists have been employed to give alternative views on the state of various fisheries resources. The Crown has even been taken to court by industry over resource rentals, and a case against the Crown for "mismanagement" of fisheries was at one stage being

prepared. (It has since been settled out of court.)

Such politicking shows the sharpness of the contests over access to the revenues that fishing quota can provide. Behind the economic contests of this sort (which, obviously, include the questions of quota allocation and distribution to Maori), a major ecological issue is that the system as it is presently conceived entirely fails to deal with wider by-catch issues. It makes no provision for by-catch of non-QMS commercial fish species or other non-commercial marine wildlife, even for those high profile issues of marine mammals and seabirds interactions – quite apart from the wider problems of marine pollution and of discards and waste of marine biota in general.

4. DISCUSSION

4.1 *Greenpeace Criteria for Fisheries Management.*

The stance on fisheries management adopted by Greenpeace is the product of many years of involvement with marine envirronmental issues. The Greenpeace International Fisheries Campaign has made, or been party to, a number of major efforts to define conceptual and pragmatic criteria for fisheries management. These include drafting the lobby document the Greenpeace Approach (GPA), submissions for the reviews of various national and regional fisheries leglislation, and lobbying for various conventions at major conferences.[17] Although each document has been couched in specific terms to address the specific situations, these have been interdependent rather than independent exercises, consistently expressing the underlying concern for protection for the marine ecosystem, and at the same time addressing social justice and equity issues of environmental quality and marine resource use.

In general terms, the Greenpeace view is that fisheries management should be "conducted in a manner that is ecologically sound to sustain the resource for present and future generations, and that is socially just, respecting, biological and ecosystem diversity" (NGO Treaty, 1992). The NZ and Australian Greenpeace submissions to recent national forums stipulate that *conservation* of the marine ecosystem must be given highest priority. Proceeding from that,

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[17] Greenpeace has made submissions on fisheries management to various major world conferences, for example: the International Conference on Responsible Fishing, May 6 to 8, 1992 at Cancun, Quintana Roo, Mexico; the Non-Governmental Organisations Fisheries Treaty, negotiated by Non-Government Organisations in Rio de Janeiro at the Global Forum, June 1 to 14, 1992; the United Nations Conference on Straddling and Highly Migratory Fish Stocks to be held in New York, July 1993. Submissions have been made to numerous policy processes including: the Sub-committee of the House of Lords for the United Kingdom (UK); the Common Fisheries Policy (CFP) for the European Community; the New Zealand Fisheries Act Review; the Inquiry into Commonwealth Fisheries Leglislation by the Australian Senate Standing Committee Committee on Industry, Science and Technology; and the Reauthorisation of the Magnusson Fishery Conservation and Management Act in the United States of America.

"What is needed is a new approach to the management of fisheries, a proactive, precautionary, conservation-oriented management regime; an approach which places co-operation above competition, and concern for the environment above excessive exploitation. [Further....,] it must be participatory, transparent, accountable, contestable." [18]

More pragmatically, the recent Greenpeace "Comment on the Common Fisheries Policy (CFP)" notes that fisheries management is fraught with uncertainty, and so:

"The management procedure must recognise these difficulties, and be robust to uncertainty, the stochasticity (randomness) in the environment, and errors in implementation."

The same paper offers procedures for implementing prudent management cognisant of these uncertaintues. This is consistent with UN Resolution 44/225, which places the burden of proof for environmental acceptability on the would-be developer or resource exploiter. This implies that Environmental Impact Assessments (EIAs) must be done before any new fisheries are developed, for fisheries in crisis, or where significant changes are planned. Before major developments take place it must first be demonstrated that irreversible changes to the marine ecosystem will not occur. Where uncertainties are present, risk-averse (i.e. genuinely prudent) procedures should be followed. Similarly, catch limits (TACs) must be set on a precautionary basis, sensitive to the conditions of the whole marine ecosystem and based on scientific understanding and not at the mercy of political lobbying. In practical terms this means that the TAC-setting process needs to provide effectively for catch limits to be reduced as well as raised. [19]

It will be apparent from the discussion which follows that New Zealand's ITQ system does not put conservation as the top priority; nor is it proactive.and precautionary. While there are some signs of cooperation between fishers in some areas for their own commercial survival, competition with short-term revenue maximising objectives is still rife.

4.2 *Economic Aspects of the Fisheries Resource Management*

At an operational level, the ITQ system has two features which, in theory, work to prevent overfishing. The first is the settting of a total allowable catch, the TAC, to limit the amount of fish that can be taken. The second is the fact that, because quota as a "catch right" is private property, the owner supposedly has economic incentive to preserve the stocks, in healthy and plentiful state.

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[18] From Greenpeace Australia's (1993) Submission to the Parliament of the Commonwealth of Australia: Senate Standing Committee on Industry, Science and Technology 'Enquiry into the adequacy of Commonwealth Fisheries Legislation' 15 March 1993.

[19] A major difficulty with the NZ ITQ system is that the TAC is a "sticky ratchet", easily put up but hard to bring down. In consequence, stocks of many species are being depleted while arguments continue over the severity of the depletions and the economic costs of any reductions.

Obviously the first factor, the TAC-setting process, is effective in terms of sustainability, only if the limits are set to reflect conservation and there is enforcement. In the absence of explicit indications that TACs are being set for to provide for species and marine ecosystem conservation (and that these objectives will be pursued with vigour, private property rights in a market-oriented economy are unlikely to encourage stock-conservation; on the contrary there are strong incentives to maximise "net present value" through fishing down existing stocks, then moving capital into new areas of economic activity. Observation of fishing activity in New Zealand over recent years does indeed sugggest that far from fostering an attitude of husbanding renewable but finite fisheries resources, much of the industry appears to be in a "feeding frenzy" – seemingly only interested in maximising short-term profits. Several factors may be contributing to this behaviour, including uncertainties about future quota allocations, and, with non-quota species, the "race for catch histories". However the underlying point is that, with private property under competitive conditions, it becomes a race to translate fish into dollars.

The market economy is built around rates of return on investment which are considerably higher than the reproductive capacity of most fish species (Rogers, 1992). The large companies may see the fish merely as an input for generation of profits and their corporate capital; they are more driven by this year's balance sheet, return on investment, and pressure from shareholders than by the health of the stocks next year or in five years' time. There is, under these conditions, the real possibility of de facto cartel operations, where the industry operates collectively to deplete particular fisheries, then moving on to other species (or, in the case of some corporates, diversifying into non-fishing sectors or exiting from fishing altogether). The treatment of orange roughy (as discussed below) somewhat fits this pattern.

In New Zealand at present, most of the quota has been aggregated to the bigger companies (essentially three ownership groups at present). For those small scale fishers left, who still have sufficient quota to be independent or free agents, the "race for fish" actually becomes more intense. One of the supposed positive aspects of the ITQ system, from a conservationist stance, was that because fisheers each had their secure catch-right, the actual fishing activity became non-competitive in nature because fishers no longer had to "race for fish" and compete with each other under open-access conditions. However this seems not to have occurred. During the Fisheries Tour in late 1992, views were expressed to the author by many small-scale fishers that in fact they:

> *"are far more competitive than ever, [they] catch their own quota as soon as possible – planning the season is nonsense, [they] have to get the fish when they're there. Then, once their own quota has been caught [they] lease what [they] can from the companies and catch that too. Getting the money – that's what counts!"*

Those who don't have their own quota lease it from companies that do. Officers from the MAF seem to believe that some fishers actually prefer this arrangement – being, in effect, suppliers to quota-holders – because then they don't have to worry about quota balancing. On the other hand,

the possible frustration of being tied to the wharf in ideal catching conditions waiting for a promised CAAQ (authorising Catch Against Another's Quota), would seem to work against this being an attractive arrangement. So, too, would the operations of quota-brokers, and non-fishing owners of quota leasing it at exhorbitant rates to fishers. It may be that many of the small fishers are effectively trapped into such arrangements, as the cost of purchasing sufficient quota to avoid dependence on (if not servitude to) the larger quota-holding companies, is prohibitive.

At any rate, when it comes to leasing quota, all conservation incentive is lost; the fishers are no longer stakeholders but become mere units of production. To give one example of how profitability pressures may work, the 1992 snapper working group was informed that the then-current lease price for snapper was $3.00 /kg. The landed price for domestic quality snapper was $3.50. the residual of .50c /kg is insufficient to cover running costs, fuel maintenance, let alone labour. On the other hand if they brought in snapper for the high quality Japanese "iki jimi" market it fetched $8.00 - $9.00 /kg. With the urge to maximise financial returns in order to cover costs, there is a huge economic incentive to high grade. The temptation is either to dump domestic quality snapper or sell it on the black market, rather than take the financial loss.

Behind these various ups and downs of current fisheries practices, the question remains of whether private property rights and sustainability goals can in reality be made compatible with each other. It is a fundamental assumption of our "liberal" capitalist traditions, that owners of private property are free to use it to make a profit from it, based on the values set by the market for inputs and outputs of a production or harvesting venture. Yet, the market considers only a narrow range of values and tends to ignore conservation values, both the intrinsic values and the needs of future generations.

It is very clear that the major proponents for ITQs assume that it is their nature as an *exclusive* property right that enables an ITQ regime to overcome the problems of open access and other fisheries management systems. Scott (1989), Keen (1988) and Ackroyd et al (1990), for example, all argue that the logical development of the quota management system is to make ownership of quota closer to land ownership, which (as Scott argues) is the paradigm of private property rights. In this regard, however, it is instructive to consider some of the environmental problems of erosion, eutrophication, hazardous waste contamination, and nature conservation faced currently in land management in New Zealand. For example, we have seen the widespread elimination of private indigenous forests without much practical consideration of the environmental impacts. Few private property owners have given paramount weight to the impacts on future generations, the intrinsic values of the forest ecosystem, or the reduction in species and ecosystem biodiversity (cf. Eco submission to Fisheries Act Review).[20]

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[20] This sort of situation has recently been highlighted by the continuing controversy in New Zealand over a farmer, frustrated at being unable to settle a compensation agreement, felling 800 year old rimu (an indigenous species) trees adjacent to the scenic West Coast highway (*NZ Herald*, 27, 28, 29 May, 1993). Ownership of private property does not, in itself, safeguard the long term conservation of a species or ecosystem any better than open access; on the contrary it may merely allocate the profits of exploitation to the owners. As a secondary consideration, it should be noted that for an ITQ system to achieve economic efficiency, the quota market must function efficiently! Lindner (1990) shows, however, that at least early in the QMS there was a failure of arbitrage; and it could be inferred from Kenyon (1992) that this is still the case. Anderson (1991) notes that under certain

What the advocates of private property regimes seem often to overlook is that the critical factor for conservation purposes is the effectiveness of *restrictions* placed on the manner in which a resource or product held as "private property", prohibiting its use in any ways incompatible with the conservation goals. This tug-of-war is very plain in the fisheries. It is a popular perception that the award of quota somehow gives a property right over the fish themselves, and not just some limited harvesting rights. Legally, the situation is, as Clark and Duncan (1986) put it:

> *"The transferable property right allocated to fishers is in the form of a right to harvest surplus production from the stocks. A harvesting right, as opposed to a property right, is an important distinction constitutionally, and has been embodied in the legislation implementing the system of ITQs."*

The first point at issue, at present, is whether the TACs are being set *and enforced* in a way consistent with long-term species sustainability; and the honest answer seems probably not. The second point at issue, at present, revolves around who has the "rights of access" to the fish – presuming, for the sake of argument, that an underlying sustainability criterion has been agreed. So, for example, the award to Maori of 20% of quota for any species newly brought under the QMS, is represented as a Treaty-right. In a related way, there are arguments as to whether commercial quota-holders should have to pay the Crown for obtaining or continuing to hold an ITQ catch right (and if so, how much). In effect, these are questions of entitlement to the streams of revenues obtainable through fish harvesting. A legal opinion obtained by the Fishing Industry Board (FIB) in early 1993, sought specifically to counter the belief that the Crown owned the resource and therefore could charge resource rents and/or require payment for initial purchase of quota from the Crown (as new species were brought under the QMS) as it saw fit. This opinion (which, it should be noted, has not so far been tested in the courts) stated that "The Crown's right to manage and conserve the fishery resource derives from obligations imposed on it by various statutes, and not from any inherent property or ownership of the fishery resource itself" (Anon, 1991). However it might equally be asserted (though, again, the legal basis for such a view is not tested) that the Crown, as agent for the "public interest," has the authority of kaitiakitanga over all fish and habitats not specifically in Maori hands, and that the "free" access enjoyed by many users to non-quota species under the permit system or as recreational users, has been merely a privilege based on mutual convenience rather than any sort of private "property right".

Legal niceties put aside, the bottom line for conservation purposes is that any award of a "private" right to utilisation of fish and fisheries be subordinated to a presumed "public interest" in species and ecosystem sustainability. This subordination is not unambiguously achieved in the present management process.

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circumstances (e.g. cost minimization manipulation) the markets for fish quota might be expected to "fail" in the same ways that markets in "pollution permits" can fail.

4.3 *The TAC-Setting Process in Practice.*

For conservation, in theory, the crux is the setting of Total Allowable Catches (TACs). In practice the ethos of the resource users is equally critical. Gilbert (1991) argues that the prevailing ethos in the industry is inconsistent with the requirements for harvesting at sustainable levels of a renewable but finite resource – rather being characterised by a desire to maximise catch, to utilise ever more powerful fishing gear, a feeling that there are always new fisheries and new grounds to be discovered and an expectation that the government will help out if things get bad. He sees this ethos as "the most important determinant of the future performance of any new fisheries management regime". An aspect of it is quota-holders' very short term view, where immediate profits are valued more highly than long-run profits (Gilbert 1991). In this context, the TAC-setting process becomes one stage in the "race for fish".

The TAC setting process is ostensibly transparent with opportunity for all interest groups to participate. Effective participation, however, requires time and money, and specialised expertise – all of which are scarce. With sizeable profits at stake, the large commercial users have both incentive and pecuniary capability to play a dominating role in the process. They can, and do, contract the expertise of the "best" consultants in the world for their purposes. (Depending on whether industry or conservationists are making the assessment, these are those most able to assist NZ scientists reach the right recommendations, or those most able to undermine the validity of MAF's research and talk up the quota.)

This "weight" of commercial interests contending with the "neutral" and "objective" MAF scientists is only partially balanced by the commitment and enthusiasm of conservation participants. The "open" and "contestible" process becomes contentious and at times acrimonious (though also, very occasionally, even cooperative). Working groups of MAF scientists with representatives of Maori, conservation, recreational fishing, the Federation of Commercial Fishermen and the Fishing Industry Association work through the current research and determine the issues to be addressed and methods to be used.

Up to this stage, the TAC setting process is at least nominally "objective"; methodologies are hotly peer reviewed, biological data inputs standardised and anecdotal information although admissible, weighed carefully. Where clear agreement has not been reached in these working groups, TAC recommendations then go to the Plenary for review and further debate at which point economic or even socio-economic information may be considered. The plenary which may take up a complete week is a more formal process, usually with more complete representation than the working groups, with discussion recorded and fuller minutes kept. This results in a report (e.g. Annala 1992, 1993 in the two most recent rounds) which is circulated to all the interest groups which reviews the fishery, the biology, yield and stock assessment data and the recommendations from the working groups or the plenary for each of the species in the QMS system.

But from this point on, although consultation continues, transparency becomes translucent at best; instead of information being freely available to all it becomes increasingly obscured by

"commercial sensitivity". The fishing industry has its own consultations with MAF in the TACC Council and other groups have theirs in the non-Commercial User Groups' Consultations. While industry is invited to the latter they tend not to attend, while the TACC Council is closed to non-commercial users. MAF do attempt to convey the attitudes of each party to the others and confirmed minutes are released to each group. The process finishes with a final round of submissions to the Minister and consultation with him. The Minister then makes his decision on TACs, guided by the NZ Fisheries Act (1983 and amendments). The long title of this Act indicates that the purpose is to "conserve, enhance, manage and allocate the fisheries resources". The Act requires the Minister to consult and set the TAC having regard to Maori, traditional and recreational fishing and then allocate the Total Allowable Commercial Catch (TACC). In parallel with this formal process, the Minister is lobbied by Cabinet, Treasury, industry and indeed any other party. The outcome is that often despite strong scientific recommendations for a substantial reduction in TACC (e.g., Chatham Rise orange roughy over recent years), the Minister may be persuaded to leave the TACC unchanged. Sissenwine and Mace (1992) conclude, on the basis of a comparison of stock assessment data and TACs, that in actual practice,

> *"TACs are not closely tied to the best available assessments of the fisheries resources, nor are catches strongly controlled by the TACs. Some valuable stocks have probably declined in abundance. To date, the track record of the ITQ management with respect to conservation is not good."*

Politicking aside, there are a number of further flaws in the TAC-setting procedures. First, the single species science being used tends to ignore the evolution of the ecosystem at large. It is not known, for example, what consequences the taking of so much orange roughy has for the food supply of sperm whales. Second, research is not evenly spread across the ecosystem or even across all quota species, let alone all exploited species.

Up until now, research has been heavily biased toward the most economically profitable stocks. For some species, hoki and orange roughy in particular, the science used, especially with the cut and thrust of industry consultants is leading-edge. For others, snapper and rock lobster, for example, there is half a century or more of research including reasonable time series data. For many other species there is virtually only landings data and where these have significant commercial value industry calls for the colloquially known "suck it and see" process otherwise termed "adaptive management". By far the greatest research funding currently goes on two species, hoki and orange roughy, which together accounted for between 25 and 33% of the total marine fisheries research budget for the 1990 financial year, including vessels, support services, administration and overheads (MAF 1991). This locks the research process into a single-species focus, from a standpoint more of the commercial (revenue-stream) implications than the more fundamental sustainability concerns of ecosystem impacts, species conservation, and social equity.

4.4 *The Cases of Orange Roughy and Snapper.*

The history of the orange roughy fishery, particularly on the Chatham Rise, is paradigmatic of the TACC setting process. A deepwater species scarcely known fifteen years ago, longlived (maybe up to 150 years), roughy are slow growing and slow to reach maturity. They have low fecundity, are deep aggregating, associated with deep pinnacle benthos, and are prey for whale, shark and giant squid. For almost all its commercial history, fishing for roughy has been managed by the ITQ system.

At a research conference in 1983 organised by the Fisheries Research Division (FRD) of MAF, all the interest groups recommended a conservative approach. This was a new resource (i.e. newly discovered, for all practical purposes), apparently bigger than anyone would have imagined. Aware of fishery depletions and collapses overseas, everyone – including various industry sectors and MAF's policy and research sections – advocated caution to ensure the same mistakes were not made with this fishery. The only dissent was from Gordon Broadhead, a keynote speaker, who suggested that quota be increased to test productivity of the resource stock (Taylor & Baird 1983, p.44). But even he cautioned that the ability to reduce fishing effort quickly was essential.

Had the exploitation of orange roughy stocks been regulated with a precautionary approach, environmental impact studies would have been undertaken and conservative setting of TACCs would have allowed both for uncertainties in the scientific knowledge and for easy rectification of any mistakes. Instead, the fishery was opened up like a gold-rush bonanza. In simple terms, "Roughy was the engine that developed the deepwater fishery" (McFarlane, FIB, pers com, 1992). Ten years on, however, the Chatham Rise roughy fishery off the East Coast of the South Island is severely depleted, and the stock on the Challenger Plateau (off the West Coast of the South Island) is officially regarded as collapsed (Sanson, Office of the Parliamentary Commissioner for the Environment, pers com, 1992). Factors other than the ITQ system itself can be blamed. The resource in the Challenger Plateau is a "straddling stock". What this means is that the boundary of New Zealand's EEZ and hence – prior to bilateral agreements with Australia and Japan – of New Zealand's fisheries management jurisdiction, cuts through the middle of the spawning area. So the collapse can be attributed to the "foreigners" – for example, the frequently cited Australian vessel (or vessels) that caught a "deck load" just outside the EEZ, then towed another full net across the Tasman only to dump it.[21]. Also, there was the rather ill-conceived scientific "experiment" in 1986-88, involving a quota swap to ease pressure on the Chatham Rise stock – doubling the Challenger Plateau TACC with disastrous results.[22]

It is harder, however, to find such mitigating factors for the failure of the TACC setting system

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[21] A "deck load" is where the hold is filled to capacity, then further fish, as much as the skipper dare within – or beyond – the safety limits of the vessel, is loaded on the deck, in the hope of reaching port before the fish spoils and gaining extra profits.

[22] Between the 1985-86 season and 1987-88, the TAC for orange roughy on the Challenger Plateau (ORH 7A) was increased from 6,190 tonnes to 12,000 tonnes but subsequently reduced to 2,500 in 1989-90 and 1,900 in 1990-91. Total catch, inside and outside the EEZ, peaked at an estimated 12,181 tonnes in 1987-88, but by 1990-91 had fallen to 1,357 tonnes (Annala 1992, p.143).

in managing the orange roughy stock on the Chatham Rise. For the 1991-92 season, the scientists argued that achievement of the goal that the fishery be sustainable required that the TAC be reduced to something like 8,000 tonnes. The Minister left the TAC that year at 23,787 tonnes, almost 3 times the recommended level. Greenpeace, believing this TACC decision to be contrary to the Fisheries Act, considered requesting a judicial review. However they decided instead to take the complaint to the Parliamentary Comissioner for the Environment. Her report vindicated the Greenpeace concerns, and contains a legal opinion that the decision was unlawful on four counts.[23] Court action was considered, but the legal costs involved are too high. (This means that, in effect, for conservation groups the TAC-setting process is not contestable.)

At present, only the discovery of new orange roughy grounds maintains present catch rates, and there is little indication that orange roughy stocks are regenerating significantly in the areas already fished out.

As orange roughy becomes depleted, the oreo dories look like becoming the next in line. There are three species, although they are fished as one; and even less is known about their life cycles and biology than about orange roughy.[24]

A history of a slightly different sort is provided by the largest snapper fisheries, those in Quota Management Areas 1 & 8 (SNA1, SNA8). These stocks are believed by fisheries sccientists to be only about half the biomass required to produce the level (maximium sustainable yield: MSY) set by the Fisheries Act. This is despite the restructuring that took place with the introduction of the ITQ system to protect this major species, just six years ago. Part of the problem has been the decisions of the Quota Appeal Authority (QAA) which has increased quota over and above the TAC. For the Auckland Area (QMA1) the TAC was set at 4,710 tonnes in 1986-87 a reduction from reported landings between 6,000 and 7,000 tonnes in the years just prior to the ITQ system but by 1990-91 QAA decisions had increased the TAC by 1,222.446 tonnes (around 26%), about 110 tonnes more than the

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[23] The following is the pertinent section of Dr. Graham Taylor's legal opinion (cited in Hughes 1992): *"Validity of the Minister's Decision Section 54. If the interpretation of MSY, TAC and TACC advanced in this opinion are correct, there appear to be several errors in the Minister's 1991-1992 decision. First, the advice that he had discretion in fixing the TACC was wrong. In so far as his decision was made applying that advice, it was unlawful. Secondly, the advice that he could move from an over-MSY take down to MSY in stages over time was wrong. In so far as he acted on that advice his decision was unlawful. Thirdly, the advice was that 8,000 tonnes was the maximium that could be taken yet still leave the fishery with a better than even chance of surviving, MSY was substantially lower. In so far as the Minister accepted that view but fixed a TACC starting from a higher figure than 8,000 tonnes, the decision was unlawful. Fourthly, if the Minister determined that TAC/MSY was over 23,787 tonnes as he must have to fix a TACC of that amount, there was nothing that I have read to support that. There may have been something before him which I have not seen which would support that determination, but, if not, the determination was unreasonable and the resulting TACC unlawful."*

[24] The distribution of oreo dories is not well known (Annala 1992), but they are often found in conjunction with orange roughy fisheries. Both are aggregating, deepwater species found on pinnacles. In some places, for example the southern side of the Chatham Rise, fishers do not know whether they are catching predominantly roughy or dory until the net surfaces. Recognising that targetting orange roughy on the south Chatham Rise could result in an overrun of the dory TACC the Minister increased the oreo TACC for the 1992-93 season. He wanted to reduce the fishing effort for orange roughy on the north of the Rise and distribute that effort to the south of the Rise and elsewhere. This increase was also in partial compensation for the reduction in orange roughy 3B TACC, but it was made despite the high uncertainty in the biological information for oreos.

previous reduction.[25]

Clearly, for each of these fisheries, the ITQ system has not met the criteria for conservative, proactive, precautionary, accountable and contestable fisheries management that Greenpeace and other environmentally concerned groups advocate. Commercial fishers do know what is happening. Moreover, some fishing practices that are "rational" under the ITQ system contribute massively to resource wastage. Frequently 50% of a trawled catch goes overboard, and often the discard ratio when there are a lot of juveniles caught may be as high as 8 cases discarded for every one kept (fisherman, personal communication). The determinant of such behaviour is that the company needs the marketable fish notwithstanding the wastage. The waste has zero value; and dumping it is zero cost to the fisher. Under the previous system of input controls, such wasteful fishing was actually illegal. It was argued at the time of introducing the QMS, that the ITQ system would prevent such wasteful practices, since if unmarketable species were being caught, both immediate economic incentive (profitable fishing) and long-term husbandry interests would motivate a shift to other fishing grounds. It can be seen with hindsight that instead, the immediate short-term necessity to get that low fraction (however low it is) of commercial fish overrides other longer term considerations. The conservation incentives alleged by proponents for ITQs are absent.

In the southern North Island Snapper fishery (SNA2) there have been annual overruns of the total allowable commercial catch TACC of 11% (1987-88), 33% (1988-89), 118% (1989-90), 147% (1990-91) and even more this last (1991-92) season. Indeed the indication is that despite an increase in the TAC and a stern warning from the Minister, the current season's overrun is again likely to be excessive. Clearly the TACC has not restrained the fishing to the extent intended. The fishermen say, "If there's fish, you catch fish!" (Hudson 1992). In this fishery, once past the beginning of the season, snapper is predominantly a by-catch (i.e. a non-target) species. Many fishers believe that the TACC is set unnecessarily low in relation to the abundance of snapper. But, whatever the "sustainable" levels of snapper might be, it is plainly not the ITQ system as such that is managing this fishery.

4.5 *Fine-tuning the Quota System.*

In each of the cases mentioned above, the TAC based on the best scientific advice has not limited the level of harvesting in the fishery. However the difficulties with the QMS do not relate

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[25] In a detailed article evaluating the Quota Appeal Authority and answering the criticsms commonly made of that process, Peter Stevens (former trawlerman and President of the Federation of Commercial fishermen) states (in Stevens 1992) that: *"It is correct that the QAA has allocated quite a significant amount of quota; however it needs to be noted that often this has been after discussion, negotiation and agreement between the appellant and MAF with the QAA simply confirming the agreement made and formally making the allocation. For example in the case of snapper in Area 1, of a total of 1,659.740 tonnes of ... [gross quota] allocated by the Authority, 1,184.80 tonnes was allocated as a result of agreements made between appellants and MAF. Only a quarter of the total amount allocated, some 474.940 tonnes was allocated by the QAA after a contested hearing."* The actual quota issued, for this snapper, 1,222.4 tonnes is gross quota less the cuts/reductions applied to the quota originally granted in 1986. Steven's biggest criticsm is that experienced and respected fishermen should have been on the Authority, as some fishermen "worked the system" and got more than their reasonable entitlement. Nevertheless other inequities were redressed but at the expense of granting more quota than the TAC reductions that were to have "saved the fishery".

only to the limits placed (or enforced) on individual species. There is also the prroblem of ecology, namly that species are not really separable from each other. Amongst commercial fishers, quota balancing, that is, the matching of species and tonnage caught against quota held, has become a serious political, practical, and financial issue. Industry has claimed that natural variation in the marine environment -- especially in multi-species fisheries -- and uncertainty in the quota market, mean that it is not always operationally possible to prevent overfishing. The particular species mix that comes up in the trawl may not always match the mixture of quota held. Nor may quota of the right species required to cover the balance be available on the market, for any, let alone commercially viable or affordable cost.

There are, in recognition of these difficulties, a number of legitimate procedures for dealing with overruns of quota and "inadvertant" by-catch. Graeme Kenyon (1992), a fisherman on the executive of the Federation of Commercial Fisermen, provides a good account:

> *"Catch in excess of quota may be landed upon payment to the crown of a fine based supposedly on port price .... if deemed values are set low enough to discourage dumping, some people will profit from overcatching (including the crown) thereby usurping the QMS. On the other hand if deemed values are set high enough to make over-catching unprofitable then some (if not all) accidental overcatch will tend to be dumped, thereby usurping the catch monitoring system and ultimately again the QMS.... The verb "to deem" has acquired a new meaning and become an addition to the regular working vocabulary of some fishermen."*

Again, it's neat enough in theory, but in practice what it means that another layer is added to a rickety structure that is vulnerable to all sorts of manipulations. One example of abuse of this system is the fisher who, although he meets permit requirements, has no snapper quota yet targets this species in the Auckland Area (QMA1), and then steams it around East Cape and deems it all in Gisborne (in QMA2), to take advantage of the lower surrender value there (personal comunication to the author, Fisheries Tour 1992). Or since the profit from value-added processing outweighs loss due to deemed value, some companies will not hesitate to overcatch if this is necessary to meet market contracts (personal communication, ibid.).

By-catch may, in some situations, legally be traded-off. This works as an alternative to deemed values. What happens is (Kenyon 1992) that "a quantum of quota of a species normally caught in association with the over-caught species is relinquished". There is some complexity in calculating the matrix of trade-off ratios. But, Kenyon argues, if fishers cooperate the system works well and without excessive administrative effort. This by-catch trade-off system is a crude attempt to manage a mixed species fishery as a system rather than a static set of single stocks. It can, for this reason, be seen as a first step toward an "ecosystem" approach. It is a desirable mechanism also, inasmuch that it reduces fishing effort (by contrast with the deemed values mechanism, which tends to increase catch effort.

Further provisions for flexibility in the way the system operates are the CAAQs and FAAQs.

These are provisions for Catching/Fishing Against Another's Quota, agreements between a fisher and a quota holder so that the former may use some of the latter's quota for a specified time or as a means of dealing, short term, with bycatch for which the fisher does not have quota. Last (but not necessarily least) there are limited over-fishing rights – essentially 10% overs and unders – that allow a 10% annual carry-over of quota from one season to the next.

As these brief indications suggest, the quota system has now reached a point of high complexity, with such great information requirements (for both fishers and administrators) that much of the required monthly quota balancing is very overdue! The time costs of managing catch records and the documentation for compliance, have become a major burden, especially for the independent fishers.

As well as legal means, there are also numerous illegal opportunities that contribute to total catches being well in excess of individual quotas and TACs for each management area/species. The desire to avoid the administrative hassles and to maximise profits from limited hold space or other operational exigencies, provide incentives from discarding lower-valued fish of either targeted or by-catch species at sea, or overrunning quota and not declaring it through to deliberate poaching and blackmarketing.

4.6 Social Equity and Distributional Issues.

Since most of the quota have, over the past decade, been aggregated to the larger companies (FIB 1992), and the smaller companies progressively taken over, there are now relatively few independent fishers. (This is apart from the rock lobster and paua fisheries, where localisation still favours small-scale operations.) Informants, in Northland particularly, stated that before the QMS was implemented there were many fishers working from the area, whereas now there are only a few (personal communication, Fisheries Tour). From Russell, for example, they estimated about one hundred worked the local coast over the summer snapper season, now there are two. Further north there were twelve working from one bay; there are just two now. The fish are still caught in these areas, but almost exclusively by much larger vessels operating from the main centres for the larger companies.

The quota required to support one long-line boat for one year is approximately that needed by a trawler for one 7 to 10 day trip. The increase in jobs shown in industry statistics (FIB 1992) involves, in large part, a transfer of employment from small-scale more independent operators supporting smaller rural businesses, to larger scale company vessels supporting factory and processing work in the more urban centres. The local people no longer have access legally to the fish either for jobs or (except on a "recreational" basis or, amongst Maori, for "traditional cultural purposes") for food.

Such social implications of the introduction of the ITQ system were clear to the planners, who foresaw that reducing catches had "obvious economic impacts, reaching far beyond the individual fishers" (Clark and Duncan, 1986). MAF was concerned about the likely impact on fishing-dependent communities and in 1985 funded a short-term contract for a brief socio-economic study of Northland,

(Fairgray 1986), an area which was known to have a large amount of small-scale and "informal" fishing activity – and which also had (and still has) one of the highest unemployment rates in the country. This study concluded, in essence, that a quota allocation strategy which gave preference in effort reduction to maintaining the inshore fishery in localities where fishing is of the greatest importance, would minimise the adverse impact of fisheries changes in the Northland area. However, having made a gesture of social concern with this brief study, which had no further follow-up, those implementing the ITQ system behaved as Clark and Duncan (1986) anticipated, arguing for "the sanctity of the policy and let the chips fall where they may". In practice this meant not just implementation of a rigorously "tradeable" regime, but also a brazen administrative convenience in excluding altogether the many "small part-time" fishers from the quota allocation. It was this double agenda of total effort limitation and industry "rationalisation" in favour of the larger operators, that was the meaning of these authors' stated concern that "any modifying of the policy will work to the long term detriment of economic efficiency in the industry and lead to misallocation of the resources" (ibid.). Since Clark was one of those managers directly responsible for introducing system, and Duncan was an economist with the FIB at that time, this gives clear indication of the conscious biases of the policy, and lack of concern for social justice towards the small, dispersed, and "part-time" fishers at the time of introduction of the ITQ system.

Since the initial "rationalisation" of 1983/86, there has been considerable further aggregation of ownership and operations within the commercial industry. (The transfer into Maori ownership of Sealord is not inconsistent with this trend.) Associated with this trend towards increasing aggregation, there is a real fear amongst some of foreign control if not actual ownership of the industry. Numerous incidents suggest good grounds for this fear, for example the Director-General of MAF's willingness to grant Sealord permission to increase foreign share ownership to 40%, prior to the company's sale in late 1992; news that fishers were securing their loans from Japanese interests with their quota;[26] and reports of the conviction of an "Australian-based company" for misreporting paua landings.[27]

Quite apart from economic and employment implications, foreign ownership or control is of direct conservation concern because foreign owners have neither the local knowledge nor the incentive to preserve the stocks. Their operations tend to be large and, especially when operated from considerable distance, less sensitive to the local ecosystem because they fish all over the world, than

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[26] Pullman, the *NZ Herald* Fisheries Reporter, in 1991 wrote: *"Japanese interests have been accused of using a legal backdoor to seize control of New Zealand fish quotas. Foreigners are banned from owning or controlling quota but up to 10 per cent of quota in the main snapper fishery is thought to be in the hands of companies that are backed by Japanese.... they fear that once quota is controlled from Tokyo, New Zealand fish companies can expect lower prices for their catch."* Among the loans were two for, respectively, $NZ 2 million and $NZ 4 million from Nichimo, one of Japan's largest fish and marine trading houses. These were made to two Auckland companies, and one secured the loan against 39 tonnes of snapper quota. Legal opinions indicated uncertainty as to whether such a debenture actually transfered ownership of quota, and the government held an urgent enquiry (ibid.). This is nevertheless indicative of the increasing prospect of foreign control.

[27] As reported in the *Southland Times:* "MAF sought forfeiture of [13 tonne] $1.8 million paua quota held by Australia-based Modesto Holdings Ltd. .... The Australia-based company was jointly convicted with its agent, ... [a NZ fisherman] and was fined $2,500."

might be the case with local fishers. The available information at least for larger scale fisheries suggests that the usual modus operandi distant water fishing operations is pulse fishing,[28] a method which appears more directed to immediate commercial needs than to long term ecosystem sustainability requirements.

Transferability of quota under the QMS has led to the result that there are relatively few fishers with sufficient quota to be independent. This has happened by fishers being excluded in the introduction of the system, or by fishers selling out in the initial effort-reducing buybacks when QMS was introduced, or subsequently by fishers tempted by the high prices sometimes offered for quota by the larger companies – for instance $50,000 for 1 tonne of snapper quota (personal communication to the author, Fisheries Tour). Sometimes, however, sale of quota can be forced on a small fisher, through needing to raise additional finance in order to maintain their operations and, already heavily mortgaged, being forced to sell quota to the larger companies. This might be indicative of economic efficiency, or it might be indicative of "imperfections" of capital markets where large corporates have easier access to bridging finance or can see and act to secure gains from monopolisation. Whatever the case, in many instances this trend to concentration has been at the expense of social-economic justice and at the expense of concern for conservation.

The aggregation limits written into legislation as to the amount of quota that can be held by any one company for a species, appear not to have prevented the concentration of quota in the hands of the large operators. Smaller companies have been taken over by larger to the extent that it is difficult to see how the spirit of the aggregation limits has been respected. There has been strong pressure from the Fishing Industry Association during the Fisheries Act Review to remove aggregation limits altogether. In 1991 three companies directly controlled 51% of the New Zealand quota while the top 30 companies controlled 75% of the total and 83% of the deepwater TACC (FIB 1992). While this represents a slight reduction in the percentage of quota controlled (2% down for the top three, and 3.4% down for the top 30) from the previous year, it still indicates a striking domination of the fisheries. Moreover, many of these thirty companies have beeen created strictly for quota holding purposes, and therefore are really parts of the same enterprise. (For example, six of them at least are in the Amaltal-Talley conglomerate.) This means that a much smaller number than 30 enterprises really dominate the fisheries.

With the sale of Sealord, New Zealand's largest single company, dissolving Maori claims to commercial fisheries under the Treaty of Waitangi, the injunction against bringing non-quota species into the QMS system has been lifted. MAF were, in 1992, advocating that the government do this by tendering rather than catch history (Office of the Minister of Fisheries). Had this proposal been carried through, it would have further exacerbated industry concentration. This reinforces the impression that, notwithstanding the aggregation limits currently existing, the present (National) government has no qualms about even greater aggregation, with more control by fewer larger companies. It is not clear how this squares up with the idea of "competition" as the engine of economic efficiency.

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[28] Pulse fishing is the practice of seriously depleting one area before moving on to the next.

Many of the fishers that would have been affected by the proposed tendering regime, are those who currently have insufficient quota to stay economically viable on ITQ species alone. Fishers feared that only those companies that have the financial resources to raise large amounts of capital would be able to tender successfully. Those most likely to have conservation interests, namely the smaller locally based companies and the few remaining independent fishers, would then have lost out to the benefit of the biggest companies.[29]

ITQs as a transferable property right, are linked in various ways to the global commodity and capital markets, and mechanisms such as joint ventures and financing arrangements for new vessels and for fish and seafood processing for export, all offer easy avenues for overseas interests (and transnational corporations in particular) to gain greater control of NZ fisheries. This is alarming because, while small-scale and locally based fishers may recognise their dependence on the long term health of the stocks, there is less likely to be concern with the sustaining of specific local fisheries on the part of large companies with short profit horizons, highly mobile capital, and substantial foreign ownership or "offshore" control. Moreover, it is quite feasible that stocks in particular areas may be seriously overfished, and then the quota sold off well before the damage becomes apparent.[30] From this perspective, and taking account of the poor state of several of the major stocks, the recent sales of the two largest New Zealand companies, Fletcher Fishing and Sealords, and also of a number of other large companies (Watties and Skeggs, for example), may be viewed with suspicion.

When the QMS system was first introduced, it was anticipated by some in the fishing industry that three companies – Fletchers, Sealord and possibly Sanford – would come to control all the quota. This certainly reinforces the notion that government policy has, for a long time, been favourably disposed towards corporatisation and industry aggregation. More recently it has been rumoured that there is a real possibility, in the not too distant future, of only one company remaining (Sealord?). The notion of management by a sole ownership corporation is a familiar one in the literature (cf. Copes 1986; Ackroyd et al. 1990). But again, how such monopolisation squares up with concerns for economic efficiency, long-run sustainability, and economic justice for New Zealanders as "owners" or "stakeholders" in the fisheries, is far from clear.

4.7 *Compliance and enforcement issues.*

In the textbook theory, compliance with the QMS is straightforward, on the basis of a matching of catch landing records from fishermen and returns from Licenced Fish Receivers (LFRs).

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[29] After strong lobbying from the industry in late 1992 and early 1993, the Minister of Fisheries agreed that catch-history will be used as a basis for allocating new species' quota. However, the main arguments put by the industry, to the effect that catch history constitutes a "property right" over access to fish for harvesting, clearly benefit companies in proportion to their documented fishing activity. Such property claims are motivated by the value of the future quota as a basis for profitable operations and as a future "capital asset" more than by any concern with wider social justice.

s on spawning aggregations catch rates remain high and therefore the fishery appears economically robust until suddenly there are no more aggregations.

But, as is intuitively obvious (Cameron and Hughes 1990),

> *"In practice, establishing whether a quota holder has overfished is not straightforward. MAF Fisheries does not maintain a running total of quota trades and this, coupled with the 10% overfishing and underfishing rights allowed for in the leglislation, makes it difficult to determine the true position."*

Originally, MAF Fisheries envisaged a team operating in each regional office, with the monitoring group sharing knowledge and expertise with the surveillance and investigations group (ibid.). It was anticipated that, with such teams operating, non-compliance could be identified from analysis of irregularities in the QMS data. In practice however, checking and following up inadvertant statutory reporting errors diverts much staff attention, and takes the time that might otherwise have been devoted to developing the more sophisticated analytical and policing skills essential for ensuring compliance (ibid.).

For the deep water, there are also difficulties from the fact that the MAF compliance unit does not actually control either of the two surveillance procedures in place, and that neither of these latter actually has fisheries compliance as its primary concern. On the one hand, the RNZAF is primarily responsible for defence, but undertakes as a secondary role to do over-flights for fisheries surveillance. On the other hand, the MAF's scientific observer teams were constituted with their prime responsibility as scientific monitoring and analysis -- and only secondarily with monitoring for purposes of policing compliance (see Lowther 1993 for a MAF perspective). Now the balance of the observer roles is being swung the other way. In fact, both scientific monitoring and policing roles are essential, and conservation groups have been concerned at what seems to have been an abrupt shift recently, with more recruitment of armed services and security personel rather than those with natural history, biological sciences, or conservation backgrounds.

Some of the biggest issues for conservation have been in the fisheries that interact with seabirds and marine mammals -- for example seals in the hoki fishery, and the rare Hooker's sea lions in the squid fishery. Although this is a compliance issue in relation to reporting requirements under the Marine Mammal Protection Act, expertise in biological science seems more relevant than policing and security for knowing the extent of the problem and finding solutions. With the present acrimony between sections of the industry and conservation groups, observers have provided the only credible data. Unfortunately the level of observer coverage (usually much less than 20%) is of very limited reliability for this purpose. The increased observer coverage on the 1992-93 Auckland Island's squid fishery augers better for the future in this respect, although conservation groups are still calling for 100% observer coverage.

Recently, the extreme extent of non-compliance and systematic evasion of quota limits has come to public attention. Industry claims that these revelations are a direct consequence of the workings of the QMS system -- the arrests and convictions being, it is implied, the result of tip-offs from within the industry. Maybe! Yet, from all accounts, offending appears very extensive and has

clearly been happening ever since ITQs were introduced. So, had the self-policing aspect of ITQs been effective, this level of offending could not have developed.

Such offending is by both large and small operators and, given the difficult rules of evidence, the offences that come to public or even MAF attention, are only the tip of the iceberg. Even amongst those officially documented there is an impressive variety, which includes: joint-venture super trawlers poaching for hoki inside the 25NM line; a level of rock lobster poaching more than half the TACC in some areas and over one third the total TACC; false accounting and quota-busting in systematic fraud with some companies making thousands if not millions in various scams; the allegation that in some areas 80% of the fish on the domestic market is from the black market.[31] Commenting on a news item that "Fishing firms face $500m fight - lawyer" (in *The Dominion*, 1 May 1993), a fishing industry spokesman stated that the costs of litigation had not been considered when the ITQ system was introduced (personal communication at the MAF Stock Assessment Plenary, Wellington, 1-5 May, 1993).

Whether the illegal catch would be proportionately less or more under other fisheries management regimes, is hard to know. Poaching has always been a problem in NZ and presumably elsewhere. But it is clear that the belief that, if fishers owned their own quota they would police it and ensure compliance, just hasn't been borne out in reality. Also however, it should be noted that while much of this offending is by fishers and fish processors within the industry itself, there are also many cases of people that were forced out of the fisheries when the ITQ system was introduced, who have not returned to fish with permits for non-quota species, but have instead become pseudo-amateurs or even blatant poachers. For example, the profits from rock lobster and paua are phenomenal, and therefore attractive to black market operators. It is almost certain that organised crime is involved in these markets. But even for the lesser-valued species, extensive illicit fishing for "informal" supply to local communities and onto local markets, may contribute to pressure on fish populations.

Looking on the bright side, it could be that increasing recognition by both legal fishers and those on the margins of the risks from uncontrolled illicit operations, is bringing about an increasing will to cooperate in fisheries management and policing. Rock Lobster and Paua fishers are, in desperation, banding together and demonstrating a little of the cooperation that was anticipated and, by levying themselves, enabling MAF to provide additional enforcement.

However, even if such cooperation develops, there are still stark conflicts of interest over acccess to fisheries – particularly the inshore fisheries that traditionally have been sources of local food and economic livelihood. If all the quota is aggregated to the large corporates, and even if they can and will manage themselves in the responsible and conservative manner that the legislation anticipates, the legal restrictions and quota limits for inshore species may still be breached through the actions of those who feel grievance at having been unjustly treated, as well as by those who are prepared to poach simply "on principle" or for the big material rewards so readily available.

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[31] See the sources mentioned in Footnote 3 above.

5. CONCLUSIONS

5.1 *The Practical Failings of ITQs.*

The authors of the report of a joint investigation of MAF by the Auditor General and the Parliamentary Commissioner for the Environment (Cameron and Hughes, 1990), noted in their conclusions that:

> *"The findings of this report indicate a system struggling to provide the necessary information for management decisions which can control fishing at sustainable levels and ensure sustainability of the fishery resource. This is reflected in: A lack of sufficient information about the fish; Difficulties in reducing catches and quota; Insufficient constraint on individual fishing activity; and: Problems in ensuring compliance."*

Indeed, the Ministerial Briefing (1990) to the incoming National Party government had already made the damning admissions that,

> *"three major fisheries in NZ, those for hoki, squid and rock lobster, are presently unconstrained by their TACs. .... In the immediate future the industry will be unable to catch the orange roughy TACs. This would lead to the situation where the four largest NZ fisheries were effectively managed on an "open access" basis."*

So even in the orange roughy and hoki fisheries which have have had such a high percentage of the research budget, the ITQ system has not prevented overfishing. Clearly, at a practical level the ITQ system does not amount to a conservative, precautionary, approach that engenders cooperation. Nor, for that matter, are its procedures transparent, publically accountable, or contestable. In reality, ITQs are far more than just a component of a system for management of levels of fishing effort. Though supposedly a means for achieving economic efficiency while respecting long-term sustainability criteria, in practice the ITQs become an instrument for the increased capitalisation of nature and society. This capitalisation process nourishes the growth of "offshore" capital (epitomised by the TNCs), without this having much obvious connection with the sustenance of livelihoods in New Zealand. In NZ, the introduction of the QMS has enabled the corporates to greatly increase their control over the fisheries, and also to increase the rate of biomass extraction from most fisheries – with little certainty as to the consequences for long-term viability of the marine ecosystems. In effect, competition and capital accumulation as a supposed instrument for "rational" resource management, has ended up an end-in-itself respecting neither ecological sustainability nor social justice objectives.

5.2 *Other Options.*

Fisheries are a part of the global heritage; part of the life support system of this planet. They are a public resource. Exploitative access is therefore a privilege not a right. Despite the numerous and intense threats to the marine ecosystem from other sources such as pollution, the threats from intensive commercial fishing are still the most immediate as well as the best documented (e.g., McGoodwin 1990). Market driven private enterprise has demonstrated that it is incapable of the essential stewardship. Drastic measures will be necessary to reverse this plunder of the global commons.

Since it is acceptable for governments to make large-scale effort reductions using criteria such as ability to pay (tendering for quota) or catch history, it should be just as acceptable to use criteria such as sensitivity to the ecosystem, selective non-damaging fishing methods. Instead of permitting the present extractive ethos to persist, and indeed to be reinforced and perpetuated as each new entrant is inculcated on the job under conditions of intensive competitiveness and financial pressures, incentives should be given for a conservative ethos. For instance, the industry should be professionalised not in terms of corporate takeover expertise but on the basis of environmental awareness. Effort reductions can be implemented by excluding the worst offenders within the industry, and an appropriate minimum level of understanding of marine ecology should then be a prerequisite for entry. Any subsequent training, such as for deckhand, engineer, mate or skippers' "tickets", or for fisheries management, should include a compulsory component of pertinent conservation knowledge.

Until there is a radical shift in the ethos of the fishing industry itself, backed by public pressure for environmental and species conservation, no management system can be effective for conserving the marine ecosystem. Calling for such measures now will be regarded as extreme, contrary to our conditioned understandings of what is reasonable. But then, so was Land Rights for Australian Aborigines in the '60s: yet by the '70s even the moderates were supporting the issue; in the '80s tribal groups were claiming their land; and in the '90s certain "aboriginal rights" were being negotiated and implemented across Australia backed with the legal force of the Commonwealth Government. In the same way, fisheries campaigners need to take the moral high ground in favour of a sustainability ethic. Neutrality or merely negative opposition to ITQs is not sufficient; a more radical and constructive stance is required.

As an interim measure, for inshore fisheries there need to be effort reductions to precautionary levels and a system of community-based management implemented with fishers answerable to their local community or bio-region. Fishers must become stakeholders again. As mere "units of production" they have no conservation incentive because they are powerless to prevent depletion by others coming in from "outside". Permits could be allocated on the basis of achieving a satisfactory level in marine ecology examinations, and would be limited to fisheries within the bio-region. Thus fishers would be dependent on the long term health of their fisheries, and answerable to the wider community with interest in that area.

For deepwater fisheries, one suggestion is that the National Fisheries Agency could sell annual vessel quotas to those companies that demonstrate responsibility toward the resources by their willingness to fund necessary levels of surveillance, facilitate observer coverage, and active research toward eliminating the various conservation issues. It would be mandatory for them to use licenced Deepwater Skippers, an essential part of whose qualifications would be a demonstrated conservation ethos.

Neither ITQs nor any other management system will prevent the plunder of New Zealand's or indeed the global fisheries until such time as a conservation ethos becomes an intrinsic part of fisheries management and exploitation. Achieving that is the real challenge.

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Why People Catch Too Many Fish

A Discussion of Fishing and Economic Incentives

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by Robert Wieland

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Summary

More than 270 fishermen, most of them independent boat-owners, crowded into a hearing in Ellsworth, Maine, last week. "I'm at a funeral today," said one of them. "My life is gone, essentially. Someone is telling me what to do and how to do it." "How many millionaires do you see up and down the coast of Maine?" asked another. "We're just common folk earning a living." With a show of hands, these common folk unanimously opposed a plan offered by the New England Fishery Management Council to reduce the catch of groundfish such as flounder, sole and haddock by 50% over the next five years. Other hearings, up and down the coast as far as New Jersey, brought similar reactions.

The Economist, May 22, 1992

A tragedy is unfolding in the North Atlantic coastal fishery. Several tragedies, actually. The depletion of fish stocks makes it harder for fishermen to make a decent living, makes fish more expensive to consumers, and upsets people who are concerned with the environment and the productivity of the oceans. Similar tragedies are occurring in other fisheries, such as the Chesapeake Bay oyster fishery and the Gulf of Mexico shrimp fishery. These situations have to do with the taking of free gifts of nature—they are examples of the "Tragedy of the Commons."

Under the "Tragedy of the Commons" people overexploit and reduce a commonly held resource by following their rational self-interest. In Garrett Hardin's 1968 essay, the example of cattle grazing on public lands illustrates this situation. An individual herder will gain from adding an

animal to his herd, while the loss due to the space and food that that additional cow takes up is dissipated among herders and felt only slightly, if at all, by the individual. Eventually, the cattle exceed the land's carrying capacity, all individual herders suffer from the overgrazing and overcrowding of the public land, and the tragedy ensues.

The Tragedy of the Commons is one of the exceptional free market scenarios in which each individual's free choices will lead to an outcome that is bad for both the individual and the group. Normally the "invisible hand" of ownership and self-interest under competition leads to outcomes wherein most individuals in the group are made better off. But in the tragedy of the commons, since no one owns the resource that is held in common, everyone's incentive is to gain a benefit from the resource before another member of the group takes it instead.

A number of resources fall into the category of being "unowned." Sunlight is, for the most part, an unowned resource. Air and rain are unowned resources. Because no one owns these resources, primary users don't have to pay anything for using them. That makes them "free goods." As long as one person's use of as much sun, rain, and air as he wants doesn't deprive anyone else from using as much as she wants, no problem arises. When one person reduces what is left for the next, a problem ensues. Most marine fisheries have been unowned resources in most of the world until recently. In fact, from the earliest Roman legal codes through centuries of British and American legal history, free access to "the sea and the fishes" has been a fundamental principle. The notion that limits on access to the sea and its bounty, either through grants of private rights or restrictions by government is—in the history of fishing—a very recent idea.

Resource managers around the country are now beginning to restrain the effort applied by fishermen. The reason is that what was once thougt to be an infinite resource is showing signs of trouble. By the measures used by the National Marine Fisheries Service, "of the 153 species or species groups for which status has been assessed, 65, or 42 percent, are overutilized." Management of depleted fisheries aims to reduce the quantity of fish caught so that stocks can rebound. Policies are generally adopted only after there is a problem (i.e., after stocks are depleted) so that a difficult situation for fishermen is made worse when they are restrained by new policies.

This paper describes what happens when limited fisheries resources are treated as free goods. While it focuses on fish, it could also be written for clean water, clean air, and the ozone layer. Treating fish as free goods leads to "too much effort pursuing too few fish." In the end, after the Tragedy of the Commons plays out, stocks are depleted, consumers pay more, fishermen work harder and make less money than they could, and the planet that we share is made worse off.

This paper discusses the economics of open access fisheries and explains how open access fails to provide incentives for fishermen to conserve the resource. Because no one can be kept from catching fish, none of the fishermen has any incentive to leave fish in the ocean for future catches. The operating assumption among fishermen must be, "If I don't take it, somebody else will."

The Schaefer fisheries population model, which illustrates population growth according to population size, demonstrates how a reduction in fishing effort can increase or leave the same amount of catch available to fishermen. This reduced effort level is more economically efficient and more profitable to fishermen. This paper shows how it is pos-

sible to transform the biological picture into an economic picture by pricing fishing effort and catch levels.

The "sole owner model" assumes that a single owner possesses the fishery and has sole rights to the catch. This paper discusses management policies in terms of their ability to approximate the economically optimal outcome under the sole owner model: first, policies by which effort can be administratively restricted, and second, some economic management policies. The latter includes tradable fishing quotas and royalties on landings.

The intended audience includes fishery managers and decision-makers, industry representatives, recreational fishermen, and conservationists who want to better understand the economics of fisheries. The Center for Marine Conservation aims to provide a readable explanation of the economics of overfishing and the open access system. This paper demonstrates that economic efficiency and conservation can be common goals. Informed decision-makers and the interested public can work toward management schemes that ensure that profits accrue to fishermen, the resource is sustained over the long term, and jobs are secured for the future.

The Center for Marine Conservation recognizes the diversity of marine fisheries, in terms of gear, areas fished, number of boats and vessels in each fishery, and the life histories of targeted species. Therefore, it is the Center's view that limiting access to marine fisheries should be assessed on a case-by-case basis. This report is simply a study and a general explanation of the economic shortcomings of the open access system of fishery management. It is not intended to be a recommendation that all fisheries be managed by limiting entry.

Introduction

FLOUNDER

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Until recent times, the seas and the fish in them have been considered an inexhaustible resource. But it is becoming apparent, in the late twentieth century, that ocean resources are not limitless and that we do, in fact, have the means to seriously deplete fish stocks. Indeed, stocks of many coastal fisheries including striped bass, sea trout, flounder, and much of the New England groundfish fishery have been reduced and are depleted. Why is this happening? We all—whether we are fishermen, fish eaters, or fish admirers—have an interest in maintaining healthy stocks of fish, so why are we allowing them to be depleted?

It is standard, when we find a bad result, to look for a culprit—someone or some group to whom we can attach blame—whether we point to fishermen who prefer the income from catching fish today to income from catching some of that fish's progeny next year or several years hence, technological improvements and resistance to biological controls, the recreational fishermen with today's effective sonar and fast boats, or to the habitat degradation that has accompanied the intensive development along our coasts.

While placing blame may be useful for venting frustration about an unhappy situation, this paper will argue that the degradation of fish stocks is the result of interactions between the physical environment, fish populations, and people, and that understanding the economic motivations of people can help us to find workable solutions to the problem. If we take note of Pogo's famous dictum, "We has met the enemy and they is us," the argument turns on the idea that there is no culprit in any of this, except Pogo's "us."

ECONOMICS: THE SCIENTIFIC STUDY OF THE ALLOCATION OF SCARCE RESOURCES

Understanding economics can help us understand why people catch too many fish. Economics is the study of how scarce resources are allocated among unlimited wants. By

"resources," economists mean those things that people use. Water is a resource, as is air and land and iron ore and fertilizer, wood, lumber, houses, and fish. By "scarce," we mean that a given resource is not freely available for the taking. Clean air was, in the past, a freely available commodity and thus would not have qualified as a scarce resource. Land can be either scarce or not scarce, depending on the type of society and on population pressure.

The first and perhaps most important word in our definition of economics is "allocation." Allocation means who gets what and how. In a tribal society, resources are often allocated by traditional rules and/or by tribal leaders. In communistic societies, resources are allocated by central planners. In free market money economies, resources are allocated by means of *contractual exchange*[1] in which an owner of a resource freely agrees to trade it or sell it to someone else. This exchange takes place in a context known as "the market," and when we look at the market we will see why the definition of economics is pertinent to overfishing.

Our explanation of free market allocation of resources has to take account of initial *endowments*[2]. Assume a farmer who owns land and who uses her own and hired labor and various other inputs to produce wheat. (We start with an example of a farmer and not a fisherman because these two

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[1] By contractual exchange we mean to include all those exchanges that imply contractual agreement, even where no explicit contract is signed.

[2] An endowment is what one possesses. All of the economics we will talk about are based on comparative statistics. In other words, we will be freezing the economic world in order to analyze it. It does not matter, for our purposes, whether the farmer bought her land or it was given to her by her parents. At the point of our analysis, it is hers, and it is therefore a part of her "endowment."

economic activities are different in ways that will help us understand the problem). Her initial endowment includes her ownership of the land, an ability to work, knowledge of farming, management skills, and money with which to hire the other resources she needs to produce wheat. The economist assumes that the farmer will combine these resources in such a way that they will bring her the greatest possible income. The farmer's resources used in production can be more accurately called "inputs."

How does the farmer know how to combine her inputs in order to achieve the highest possible income? "Prices" is the short answer. Prices and the effect of an additional unit of input on the value of the expected output—in this case, the income from the wheat harvest. If one unit of fertilizer will boost the farmer's production income by an amount that more than offsets the cost of buying and applying the fertilizer, then she will buy and apply that unit of fertilizer. She will, in fact, buy and apply more and more fertilizer until the cost of buying and applying another unit approximates the value of the additional output that can be anticipated from the use of that last unit.

The cost of the additional unit of output is the "marginal cost." This is shown in the graphs of Figures 1a and 1b. Among economically efficient producers, marginal costs of production are less than or equal to the marginal value of the product being produced. At the level of input use where the last input applied just barely pays for itself in terms of additional production, the profits of the farmer will be maximized.

The production of telephones, clothing, paper, and any number of other products follows the same principles outlined for our hypothetical wheat farmer. Due to competition among producers—all of whom should be striving to combine their available resources so that marginal cost of their

last unit of production equals its marginal revenue in the market—prices are determined in the marketplace, and are merely agreed to by producers or firms. The firm sets its price for the good or service according to what buyers are willing to pay for that good or service in the marketplace. Adam Smith showed how the self-interested behavior of suppliers and consumers is guided as if by an "invisible hand" toward efficient allocation of resources. The amount of goods supplied in any market depends on prices of inputs and outputs, and quantities demanded depend on prices, alternatives, consumption preferences, and advertising. It can be shown that, in general, when wants and needs (the demand curve) are satisfied by competing suppliers of goods and services in a freely clearing market, everything is efficiently allocated. But reality is often a different case. This paper discusses one way in which free markets can fail to efficiently allocate available resources.

THE PROBLEM WITH FISHING

The analogy above only goes so far, however, because fishermen do not *produce* fish, they *catch* them. Fish are what is known as a "capture resource," and the economic model for how they are brought to market is different from the production model described above.

As long as environmental conditions are correct, fish produce fish. Fishermen catch fish. In the production model described above, the wheat farmer owned the land on which the wheat was produced, and she was thus able to keep all of her harvest to herself. If any person could come along and harvest her wheat before she harvested it herself, then she would have little incentive to go through the effort of producing the crop. The farmer holds property rights to the crop by virtue of her ownership of the land. Since no one owns a fishery, and anyone with the proper gear can come and "harvest" fish from it, fishermen are, in some ways, like a row of combines lined up at the edge of the

Figures 1a and 1b

At the Margin

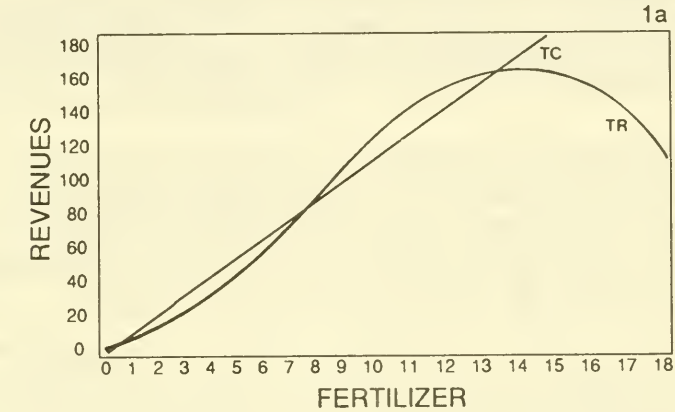
A "marginal product" refers to the impact of an additional unit of input used in a production process. The production effect of the first unit of output applied is different from the effect of the tenth unit applied.

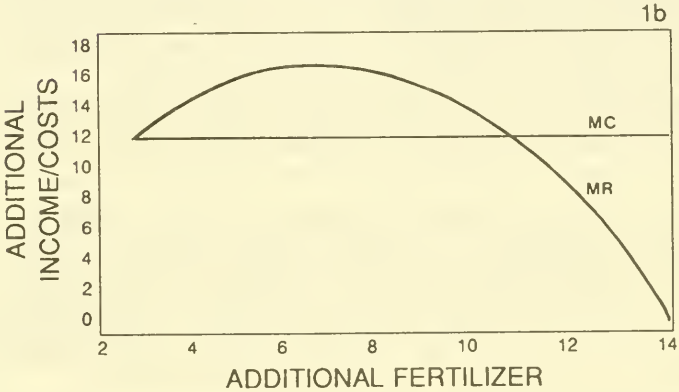
Figure 1a shows total costs and total revenues for a farmer buying fertilizer. The total revenue curve is derived from the effect of fertilizer on the output. If the value of each additional unit of output is constant, we can measure the production effect in dollars as opposed to bushels and interpret the graph this way. The first few units of output produce a slight increase in production, but, moving to the right on the horizontal axis, the effect increases more and more up to the point of diminishing returns. This is the point at which the output effect begins to slow. Eventually, increased quantities of fertilizer will start burning up the crop, leading to less output for additional units applied. The total cost curve describes the amount that the farmer has to pay for any level of fertilizer application. As we assumed for output, the price of an additional pound of fertilizer is constant.

Figure 1a shows that from zero to 7 units of fertilizer, total costs are greater than total revenues. Obviously, our farmer would not want to apply fertilizer at any of those rates. At about 13 units of fertilizer, the total cost curve becomes greater than the total revenue curve again so, likewise, the farmer would definitely not want to use more than 13 units of fertilizer. But where, between the range of 7 and 13 units of fertilizer, would the farmer choose to stop applying more fertilizer?

We can answer this question by creating, from the total costs and total revenues curves, another graph (Figure 1b) showing how much additional production our farmer would get if she used another (a marginal) unit of input. This is the graph of marginal costs and marginal revenues.

The marginal cost curve in Figure 1b shows the cost of using another unit of fertilizer, or the price of another unit of fertilizer. The curve is flat because it does not show the cumulative costs—only the cost of a single unit of input, whether it is the first or the 31st. The marginal revenue curve shows the additional revenue gained by using an additional unit of fertilizer. The effect of fertilizer on output is different at different levels of fertilizer use.





The marginal cost and the marginal revenue curves show the point at which another unit of fertilizer will cost more than it is worth. At 10.5 units of fertilizer, the value earned by using another unit equals the cost of buying (and applying) that unit. This is the point at which profits are maximized. Beyond this level of fertilizer use, marginal cost is greater than marginal revenue and money is lost on each additional unit of fertilizer used. If we go back to the total revenue and total cost curves, we can see that total revenue was still rising at 11 and 12 units of fertilizer. In that graph, it was not so obvious that revenue was rising less than the additional cost of the 11th and 12th units of input, and this is what makes the graph of what happens at the margin so useful.

wheat field at harvest time. Without enforceable property rights, fishermen have an incentive to fish as rapidly as possible to prevent others from accessing their fisheries resources. What they do not catch, someone else will.

The problem is that as technology improves, the increased efficiency that should be making us all richer make us all poorer instead, once a certain level of fishing has been passed. Once the capability exists to catch more fish than nature is capable of replacing, everyone begins to lose.

To understand how the free market allocation of resources in the production of wheat, clothing, and telephones is efficient when supplies are determined by marginal costs, but fishing to the point where the fisherman's cost of catching another fish is equal to the price of that fish in the marketplace is not, we must consider more closely the fundamental difference between farmers and fishermen. The farmer either owned or hired all of the resources—land, seeds, tractors, and other equipment—that she needed to produce her wheat. Or did she? She didn't have to pay for the rain—although she could have substituted for the uncertainty of rain by buying an irrigation system—and she didn't have to pay for the sunlight. If you consider rain and sunlight as resources, they fit into a category of resources that economists call "free goods." She also got to enjoy several public goods, such as roads and education, but, in general, the farmer had to pay all of her costs of production.

The fisherman has to pay the capital cost of his boat and gear, the variable costs of operating it such as labor, bait, and fuel costs, and licensing fees, and he has to contend with a very demanding work schedule. He does not, however, have to pay anything for the fish the way the farmer pays for her land and the growing of crops. Fish are treated as a free good. Fish are free gifts from nature, whereas farm crops have to be invested in and grown. But, when the tech-

nological capacity exists to fish the fishery to a depleted state and demand for so much fish exists in the market, the fishery will be depleted unless something is done to change the fishermen's incentives.

Consider what would happen if there was only one fisherman, and he had the capability to catch whatever proportion of a fishery he desired. Would he catch all of the fish? Probably not. Part of the reason is that he would consider the value of his future earnings from catching fish and this would lead him to seek a sustainable catch level. He would not fish out or "mine" the resource. It is likely that the value to the single fisherman of a constant stream of income from fishing is higher than the value that would be earned catching all of the fish in one season. Income that can be earned by fishing a well stocked fishery year in and year out is greater than the value of fishing down stocks in the present year.

Fishermen do not choose a sustainable level of catch when there are many because they can't. They cannot exclude other people from entering the industry, so whatever one does not catch, someone else will—as long as there are profits to be made by taking it.

Chapter 2 discusses the incentives of the open access fishery and ways in which profits attract new fishermen into the industry. We will show that, if access to the fish cannot be controlled, technological capability and market demand will tend toward reduced stocks. We will then discuss policies by which the single fisherman outcome could be approximated. First, however, we must consider the fishery "production function" and see what this tells us about fishing.

The Biology, Economics, and Bio-economics of Fish Populations

In Tobago, villagers join with fishermen who row a large net out from the beach and back again to pull in large masses of nutritious fish. The fishermen give some of the catch to their helpers, and they carry the rest to market. In the interest of improving the income opportunities of the local populace, the Agricultural Development Bank of Trinidad and Tobago is attempting to find borrowers for loan investments in coastal and offshore fishing. If someone were to carefully monitor the coastal fish stocks around Trinidad and Tobago for the next ten years they should expect to find that the total amount of resources committed to fishing coastal fish will increase and that, eventually, the quantity of fish caught will decrease.

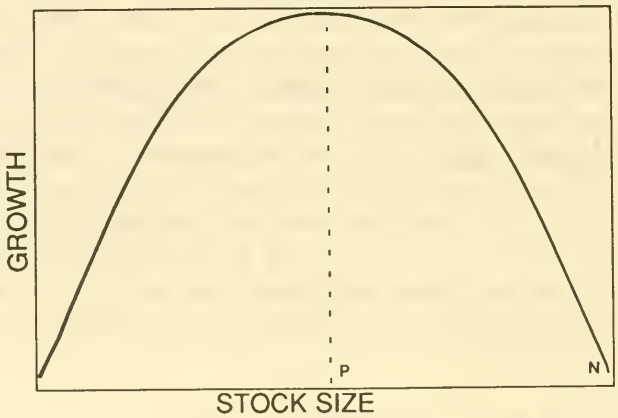
THE BIOLOGY OF FISH POPULATIONS

Population dynamics uses mathematical models to explain and predict changes in populations over time. Such modelling provides a way to represent commonsensical ideas in a framework that allows scientific analysis. Our model of population growth will be the Schaefer logistic model, which is a workable approximation for what happens among many important marine populations.

The Schaefer model puts population (measured by weight, or biomass) on the horizontal axis and change in population on the vertical axis (again, measured as biomass). This allows one to show graphically the idea that the number of fish you start with has an impact on the number of fish that will be added to the population over any period of time. See Figure 2 for closer detail and an example.

If one considers a very small fish population in a high capacity ecosystem, one could reasonably expect the population (number of fish) to grow fairly quickly, but the biomass (the overall mass of the fish) to not be so great, because we are starting from a very small base of fish and getting a lot of small young fish as recruits. Considering a

Figure 2



The Schaefer Logistic Model of Fish Stock Growth

Figure 2 shows the growth in a fishery that one could expect over a year, depending on how many fish you start with. If you draw a straight line up from a given stock size, point P, to the growth curve, you can read the expected annual growth in stock size for the given starting stock size.

Note that the growth curve forms a bell shape. The same level of annual growth occurs for two different sizes of fish stocks. At smaller stock sizes, growth is limited by the number of fish. At larger stock sizes, growth is limited by environmental constraints and mortality.

medium-sized population, in terms of the carrying capacity of an ecosystem, the increase in the biomass per unit of time would be very high, because that is what we mean by medium—there is still plenty of carrying capacity to support continued growth. If we assume a very large population relative to the carrying capacity of an ecosystem, then we would expect less growth in stock because of competition for resour-

ces. The Schaefer model shows all of this by drawing a bell-shaped curve on the graph described above.

One can see several important relationships through this graph. One thing to note is that as one moves away from the origin (the intersection of the two axes) on the horizontal axis, the growth rate increases from one level of stock to the next until one gets to stock size P*. Past stock size P*, growth in biomass declines as you go to larger stocks. At population size N*, the population growth rate is zero. At N*—for some given species in some given environment—an equilibrium is established, wherein new growth and mortality just balance each another out and the system is homeostatic. This stock level can be thought of as the natural equilibrium size. If some one-time event causes the population level to fall, it will increase each year at the rate implied by the growth curve until it reaches the natural equilibrium size. Fish populations greater than N* have negative population growth over time, so they too would be tending back toward the natural equilibrium size.

We can also see from the biomass growth curve that there are two different stock levels at which the same rate of population growth occurs. At one of these points, population growth is constrained by the mathematics of small numbers in which relatively large numbers of new fish are recruited, and existing stock grows well, but growth can only be so great due to the smaller starting population. At the other point, population growth is constrained by competition among fish, greater mortality, et cetera. There is, in fact, only one point on the growth curve that only one population level will get you to, and that is population size P*. At population size P*, the growth rate for the fishery is maximized. It is as great as it can be, given the ecological carrying capacity and a species' population characteristics.

In an important sense, the Schaefer model gives us a picture of the production function of the fishery. Just as in our farming example where, up to a point, more fertilizer results in more wheat, larger fish stocks, up to a point, generate greater production of biomass over any given period. Recall that the farmer decided how much she wanted to produce on the basis of input prices, output prices, and the production effect of the inputs. But, in the case of the fishery, the production function is largely outside of the control of people. Fishermen can affect production by their taking of fish and by the resulting changes in the level and composition of fish stocks, but they are responding to prices over which they have no control, and in terms of total fishing effort, the effort of any individual fisherman is insignificant. We will now change the frame of reference on our graph to consider in closer detail the impact of the fisherman on the natural production function.

FISHING AND POPULATION BIOLOGY

In order to describe the catch model for the fishery, it is first necessary to simplify reality somewhat. Whereas each fisherman has a different capacity in terms of his boat, equipment, skill and luck, it will be assumed for the sake of simplicity that all fishing effort can be reduced to a single measurable quantity such as number of vessel fishing days. We will also not take into account such elements as recruitment variability, interdependencies of fish populations, and unusual or catastrophic natural events.

When fishermen enter the fishery model described above, they introduce a new fish mortality factor (fishing) that affects the population size. It particularly affects what we called in the Schaefer growth curve the "natural equilibrium size." Fishing reduces it. Depending upon the amount by which any level of fishing effort reduces a fish population, there will be a certain annual (or whatever time period) natural replacement of biomass from the new stock level.

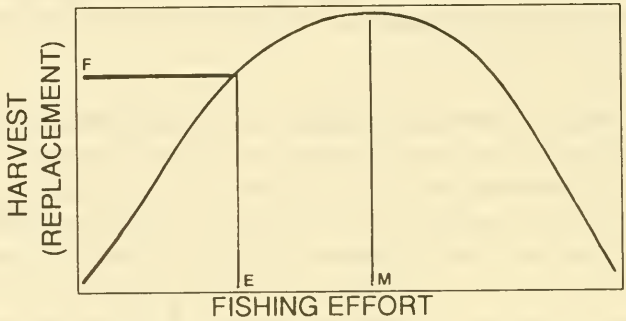
The annual increase in biomass for a fished fishery will be greater than growth in a non-fished one. This is because, as we said above, the population is tending toward N* and net growth at that level is zero.

The catch curve described in Figure 3 shows the maximum sustainable catch per unit of fishing effort and, for reasons that should become clear, it is very similar to our original biomass growth curve. Each level of effort on the horizontal axis implies a certain equilibrium population size. Because of this assumed relationship between effort and long term population size, the shape of the catch curve is determined by the natural replacement of biomass at any level of effort. For any level of fishing effort such as E* we can anticipate being able to take F* amount or less of fish catch annually, for as long as we like.

It is important to note that the catch graph shows that the same level of sustained catch can be had for two different levels of fishing effort. This is reasonable when we think about it, because the annual increase in biomass was also the same for two different levels of fish populations, and we said above that the level of effort implied a certain equilibrium population. Studying the catch graph carefully will show that, while there is a direct relationship between the biomass growth curve and the catch curve, the stock size did not just trade a label with fishing effort. The stock scale got reversed. Smaller populations are the ones that will require more effort to obtain a certain annual catch. Larger populations allow a given amount of fish to be caught with less effort. Therefore, on this graph, lower levels of fishing effort imply larger stocks of fish and higher levels of effort imply smaller stocks of fish.

Obviously, if one can get the same catch level from two different levels of effort, it makes sense to fish at the level that requires the least amount of effort and to regard the other

Figure 3



Effort versus Catch

Figure 3 shows the relationship between different levels of effort and catch and the maximum sustainable catch that can be expected at any of the effort levels given on the horizontal axis. It is derived from the growth curve graph of Figure 2.

The maximum quantity of fish that can be caught in a year without reducing the stock size is given by the catch curve. This curve is determined by the biology of the fish stock and the environment. Start at an effort level of zero, at which no fish are caught.As effort increases, population size can be expected to decrease.

At small effort levels (those to the left of M*), the maximum replacement described by the catch curve is limited by the fact that the population is still very large relative to the carrying capacity of its environment. Thus, very light effort will not take many fish, but neither will the fish stock have a fast growth rate. At higher levels of effort (up to effort level M*), larger annual catches are sustainable because environmental carrying capacity limitations become less of an issue. Past effort level M*, additional effort will reduce catch levels. At those levels of effort, so many fish are being taken that growth is limited by smaller stock sizes. M* is the level at which the fishery yields its maximum sustainable growth.

If catch exceeds any point on the maximum sustainable catch curve, the fish stock becomes depleted. Conversely, catching some number of fish less than the maximum sustainable catch curve results in the fish population moving back toward a larger stock size.

side of the curve as irrelevant. Unfortunately, as will be shown below, the open access fishery will invariably take us to the less sensible side of the graph.

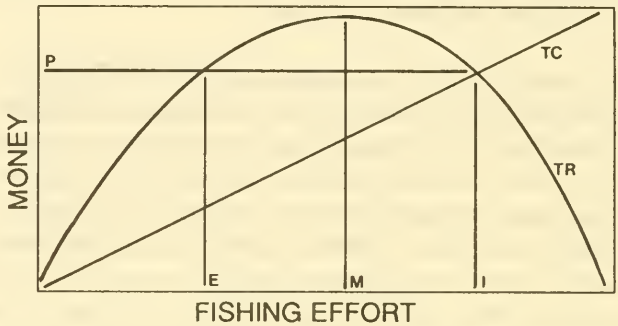
In review, very small fish populations and very large fish populations both generate small rates of annual biomass growth. Medium sized populations generate larger amounts of annual growth. One population size will produce the greatest possible increase in a year, and this is called the maximum growth rate. In terms of fishing, catch depends on effort and fish stocks and, except for one certain level of effort, any given level of sustainable catch can be had at two different levels of effort. So, why do fishermen spend more effort than they need to to catch fish?

THE ECONOMICS OF THE OPEN ACCESS FISHERY

Mathematicians can take the graph that started with the Schaefer logistic growth model and was then incorporated into a graph of annual (or some such period) production at different levels of effort, and use it to support a graph of the important relationship between revenues from fishing and fishing costs. If we think of the fishing industry as a whole and make the simplifying assumption that an extra level of effort requires a constant extra cost (e.g., one more boat-day equals $1,000 more dollars), we can represent the total costs of the industry on a graph of dollars versus effort. By saying that costs were constant for additional effort, we have described a straight line on the graph. This line is called the industry total cost (TC) curve (see Figure 4).

We can also describe the catch or production curve in terms of value. If the simplifying assumption is made that one additional unit of fish brought to market adds a constant additional value to the total catch, then the vertical axis of the catch graph can be described in dollars. By multiplying any catch level by the price of a unit of fish, the catch curve becomes the maximum sustainable total revenue (TR) curve for the in-

Figure 4



Total Costs and Total Revenues in the Industry

The graph above shows the catch curve factored by the value of the fish (the price of fish). The catch curve (showing the relationship between effort and maximum sustainable catch) thus becomes the total revenue (TR) curve. The line from any point on the effort axis to the TR curve gives the maximum sustainable revenues that could be extracted from this fish population at that level of effort. At effort level E*, the maximum sustainable industry revenues would amount to P* dollars.

The graph also shows the total costs (TC) for the industry. As with the single farmer considering the effect of a single input in her production process, an additional unit of effort adds a constant cost to the industry. So the TC curve is a straight line.

The TC curve intersects the TR curve over effort level I*. I* represents a level of effort that can achieve P*, maximum sustainable revenues over time. This same level of revenues could be achieved with less effort at effort level E*, but the industry tends toward level I* because, up to that level of effort, there are unclaimed rents available.

Effort level M* represents the level of effort that provides the greatest biological yield and, therefore, the greatest gross revenue yield from the fishery at a certain stock size. As will be shown later, this is not the economically optimal catch level.

dustry. Any line from any point on the horizontal axis up to the TR curve would represent the amount of dollars that would be generated by catching that number of fish. The line from point M* to the TR curve shows the maximum sustainable revenue that could be generated from fishing this stock.

If we show the TR curve and the TC curve on the same graph, we notice that the TC curve cuts the TR curve on the right side of M*, on the graph. This is the graph that shows us why fishermen fishing an open access fishery will tend to spend too much effort chasing too few fish. If we consider any point on the TC curve to the left of where it intersects the TR curve, we can see that the level of effort corresponding to that point could generate more revenue (draw a vertical line from the TC curve to the horizontal axis and to the TR curve) than costs. The piece of a line drawn from the TC curve to the TR curve can be thought of as industry profits. Thus, those who catch the most fish get the most profits.

Consider our farmer again. If another unit of fertilizer could generate enough extra revenue to pay the cost of buying and applying the fertilizer and still maybe leave an additional bit for the farmer, then she would choose to apply the fertilizer. But, we showed in Figure 4 that total revenues could still be growing even after marginal revenues went negative. In the example of field crop production we said that the farmer got to choose how much fertilizer to use and that she stopped at the profit maximizing point where marginal costs equal marginal revenues. In the open access fishery, no one gets to decide how much total fishing effort is applied and this is, again, the root of the problem. As long as fishing generates profits, additional effort will be applied toward catching fish. The end result is that fishing effort will increase until there are no more profits to be made. And at that point—if what we have said about growth, production, and total revenues is true—too much effort is chasing too few fish.

A CLOSER LOOK AT INDUSTRY COSTS, REVENUES, AND FISHING EFFORT

In this section we will look closely at an important presumption that was slipped into the final piece of the model. By relaxing that presumption (by changing it), we will show what happens when technological improvements occur.

What if the technological capability was not so great relative to the task of fishing our hypothetical fish stock? In other words, what if the TC curve rose sharply and intersected the TR curve to the left of the maximum sustainable yield? This may not be "economically efficient" because as we showed with the wheat farmer, when total revenues equal total costs, then marginal costs are usually greater than marginal revenues, but at least we would not find ourselves in the position of using more effort than is necessary to catch a given amount of fish. This is where some ocean fisheries have existed in relation to fishermen for many centuries. Some others could be and were overfished with the available technology. But what happens when we start with a less efficient technology and then improve it?

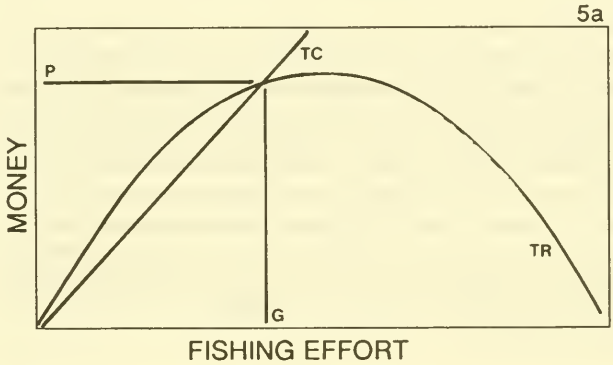
If we start with a situation where the available resources and the available technology are not capable of overfishing a fishery, then we imply a steep TC curve that intersects the TR curve to the left of the maximum sustainable yield. A technology improvement can do three things. It can either allow the same amount of fishing effort to be expended at a lower cost; it can allow more fishing effort to be expended at the same cost; or, it can allow more fishing effort to be expended at a lower cost. In any event, a technology improvement will, in general, improve the cost effectiveness of fishing effort. If the cost effectiveness increases, our industry cost curve will pivot downward. (See Figures 5a and 5b.)

But an improvement in technology will also affect the industry TR curve because each unit of effort will now catch

Figures 5a and 5b

Another Look at Industry Total Cost and Total Revenue

Figure 5a shows a fishing industry that is not in danger of taking us to the inefficient side of the catch curve—that will not result in stock depletion on the scale shown by the previous graph. In terms of economic efficiency, the open access model will still result in too many resources being applied because the incentive to fish away all the rents in the fishery still exists. But it does not land us on the right hand side of maximum sustainable yield, at which point the application of less effort will result in the supply of more fish. If we assume all the profits will be fished away up to the point at which total catch revenue equals total industry costs, then fishermen will apply effort level G and both costs and revenues will equal P.



more fish. The increase in total revenue up to a new maximum sustainable point on the TR curve will describe a steeper path because, by what was just said, more fish can be caught for less effort. The slide down the inefficient side of the curve is also steeper for the same reason. Thus, both aspects of the economic technology improvement work against staying on the left side of the maximum sustainable yield. At some level of technological improvement, the in-

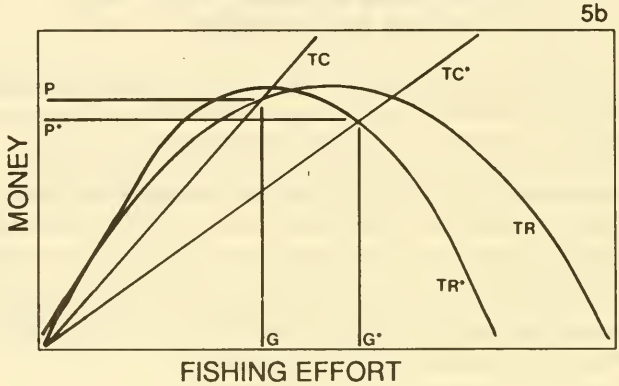


Figure 5b combines Figure 5a and the graph of a technology change that results in greater catch at lower levels of effort and lower costs per unit of effort. The graph without the superscript star describes the situation before a technological improvement, and the one with the stars describes the situation after a technological improvement. The open access outcome after the technology improvement is now to the right of maximum sustainable yield. It is now not just economically inefficient, it is biologically inefficient. Notice that under the new TR and TC curves the industry revenues have fallen from P to P*. There now is greater effort pursuing these reduced revenues.

crease in catch will deplete the stock, causing fewer fish to be caught and requiring more effort to catch these fewer fish. There is considerable empirical evidence that many important ocean fisheries are currently suffering from this sort of pressure.

One aspect of the importance of the relationships between effort, catch, revenues, and costs is that, where the TR curve

intersects the horizontal axis of the graph to the right of the maximum sustainable revenue, more effort will catch no fish. That is because at that level of effort there are no more fish to be caught. Similarly, if some technological change shifted in the TR curve, and effort remained at its old level for a time, then more fish would be sought and caught than could be sustained over time and the fish stock would gradually be depleted. If effort were sufficiently efficient after the technology improvement, and demand for fish were great enough (i.e., if the price consumers pay were high enough), then the stock could be fished to extinction.

How can we call it a technology improvement if it causes fewer fish to be caught? What kind of "improvement" could lead to the extinction of a fish stock? *Over a certain range of effort,* an economic technology improvement increases the profitability of fishing. With a technology improvement, the revenue that accrues to the industry is increased relative to any level of effort or investment over certain range of effort. The number of fish supplied to consumers would also be greater (again, over that range). If the industry could be restrained to the efficient range of effort, more fish could be brought to market for less money (in terms of industry costs). Not incidently, fish stocks would be maintained at higher levels than those portrayed in the market failure described above.

Chapter 3 describes the "efficient" level of effort for fishing at any higher level of in terms of natural resource rents. If we consider that fish have value before they are brought to market, then we can understand natural resource rents. Understanding efficient outcomes in terms of natural resource rents will help us compare various policies aimed at ensuring that people do not catch too many fish. If we ignore the fact that fish in the sea have value, then we are well on our way to inefficient outcomes for consumers, the fishing industry, and the fish in the sea.

Resource Management Policies from the Economic Perspective

ECONOMIC EFFICIENCY AND RENTS

For engineers, efficiency is the ability to achieve some end or make a product with minimum effort or inputs. Getting the greatest output for the least inputs with the current technology would represent 100% efficiency. When technology changes, whether or not it can be considered a technological improvement depends on whether it reduces the number of inputs needed to get a certain output.

Economists have a similar concept of efficiency, except that they price all of the factors of production and use these prices to evaluate "productive efficiency." Productive efficiency is defined by Kopp[3] as "..the ability of a production organization to produce a well-specified output at minimum costs." This is the economic corollary to the engineering efficiency described above. The concept of productive efficiency is very important to micro-economics because most of the models of supplier behavior are based on the assumption that all of the producers are achieving productive efficiency.

There is, however, another important use of the efficiency concept in economics. Recall that economics looks at the allocation of scarce resources. Efficiency in that context implies not only that the suppliers use the minimum amount of resources necessary to supply some amount of output—it also means that the wants of consumers are communicated to suppliers in such a way that quantities demanded equal quantities supplied. This is known as market, or price, efficiency. If the proper conditions occur, demand and supply are matched by prices in markets. Sometimes prices move to

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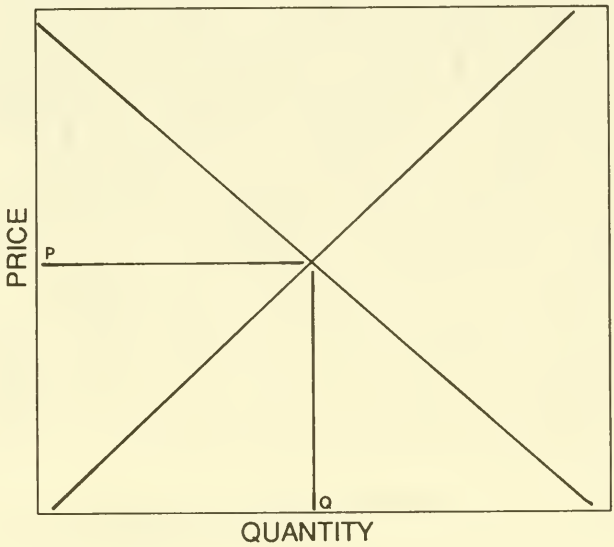
[3] Raymond J. Kopp. *The Measurement of Productive Efficiency*, Resources for the Future, Washington, DC, 1981.

meet demand conditions and sometimes supply moves to meet prices.

Consider what would happen if an unexpectedly large salmon catch brought hundreds of extra tons of this fish to the market. If demand remained constant, then the price of the salmon would have to fall in order for all available supplies to be sold. Or consider what would happen if the Food and Drug Administration published a report saying that eating salmon cured cancer. Demand for salmon would sharply increase, prices would rise, and additional effort would be spent trying to bring more salmon to market. In either case, the mechanism that would alert buyers to buy more or that would alert salmon fishermen to catch more, is price. Clearly, prices carry information from consumers to suppliers regarding how much they are willing to pay for a given quantity, and prices carry information from suppliers to consumers regarding how much can be supplied at a given price. If consumers want more of a product than is being offered, then they must bid up the market price to bring forth that additional supply. If suppliers want to move additional volumes of their products, they typically must reduce their prices.

On the assumption of productive efficiency, a market price defines how much of society's available resources are used in making the commodity, and this, in turn, determines how much of the good is produced. The area below the supply curve in Figure 6 tells how much of society's resources are "spent" on supplying the good. Although the suppliers are doing the spending (by paying the costs of production), consumers are giving them the money to do so by buying the final product. Notice that, moving along the supply curve up to where it meets the demand curve, there is a positive difference between the cost of supplying that amount of the good and the equilibrium market price. This is called "rent." It accrues to the owner of the productive resources.

Figure 6



Market Supply and Demand

Markets are where the free choices of many demanders and the self-interested response of many suppliers meet at some mutually agreeable level of production. In this graph of price over quantity, the demand curve describes a situation in which demanders want a lot of the good at lower prices but less at higher prices. Conversely, the supply curve shows that at a higher price a great deal of the good or services could be brought forth and that, at lower prices, less of the good or service could be supplied.

The supply curve and the demand curve here are moving in opposite directions (in terms of prices and quantities), and they only meet once. The quantity that demanders would like to have is the same as the quantity that suppliers are willing to supply *at one price*. However, changes in people's preferences or wealth can change where the demand curve falls. Similarly, changes in technology and/or changes in input prices can change where the supply curve falls.

By rents we mean a monetary value that a productive factor has when it is used[4]. By using land for farming, land has a use value that, together with its scarcity value, helps determine how much is paid for it in the marketplace. In this example, rents can be thought of as the farm profits that can be attributed to the land. Land rents will keep on accruing over time (unless the land is degraded) so that the value of the land is in part determined by the sum of net revenues that will come in future years (discounting for the fact that they will happen in future periods—i.e., a dollar made next year is not worth a dollar today). Rents to land, in a private property system, accrue to whoever owns the land. The owner can capture those rents by farming the land or, since rent is figured into the value of the land, by selling the land. And, of course, if the land owner lets someone else farm the land, he will typically charge that farmer "rent."

Rents in the fishery are different because nobody, or everybody, owns the fish. In the absence of any rule to the contrary, the rents in the fishery accrue to whoever goes out and catches fish. Because of this, our ability to overfish can result in depleted stocks. The economic equilibrium that the "rents-to-the-harvester" model tends toward is one in which too many fish are taken and no net rents accrue to the fishery. We have seen why, in the open access model, we get this inefficient and undesirable result. Below, we will explain how to recognize the economically efficient outcome and discuss some policies for improving our utilization of fish.

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[4] To be more technically correct, rent is the difference between the return one gets from using a fixed factor of production and the returns that would be gained from applying that factor to its next best use. For a more detailed description of rents see David Ricardo (1817), "The Principles of Political Economy and Taxation."

THE SOLE OWNER FISHERY

As we have already shown above, the fishing industry does not work the way most productive industries work. So what has either market efficiency or productive efficiency got to do with fishing? Let's go back to the reason why the industry will fish at a level wherein more effort is being spent to supply some number of fish than is necessary. We said this was happening because short of the intersection of the TR curve with the TC curve there are profits to be made from fishing. These profits, or rents, attract more fishing effort, even though at some point, greater catch for one fisherman means less catch for another. While there is some level of effort that would maximize the industry's profits from fishing, total fishing effort in an open access fishery will tend toward a point at which the rents are dissipated. This occurs because effort levels increase (existing fishermen increase their levels of effort or new fishermen enter the industry) until the rents are dissipated among new entrants.

If the fishery belonged to a sole owner who could exclude other fishermen, then the outcome would be quite different. Under sole ownership, we would expect the fisherman to fish at levels to the left of the maximum sustainable yield, because the fisherman would be concerned about the number of fish that he could catch in the future as well as those he might catch today, and because we have said that he would be able to exclude other fishermen. The same individual choice of any fisherman in the open access fishery would not have an effect on the catch outcome because as long as there were profits to be had from fishing that fish stock, someone else would want to catch whatever a foreward-thinking fisherman might leave for the future. But, if the sole owner can exclude other fishermen, then he would likely choose the profit maximizing level of catch, which is on the left side of maximum sustainable yield.

We are not proposing that fisheries should be owned by individuals. The reason for discussing the sole owner scenario is to illustrate how catch outcomes would change if we changed one of the fundamental assumptions of the model. This particular change—changing from many self-interested fishermen to one— allows us to state simply the economically efficient "best case" for a fishery. That is the profit maximizing outcome. It is important to note, however, that a government acts as a sole owner, to the extent that the public entrusts management of the resource to the government and its agents. The assumption will be made below that, whoever the sole owner is, the objective will be maximizing the returns earned by utilizing the resource. This is shown in the graphs of Figures 7a and 7b.

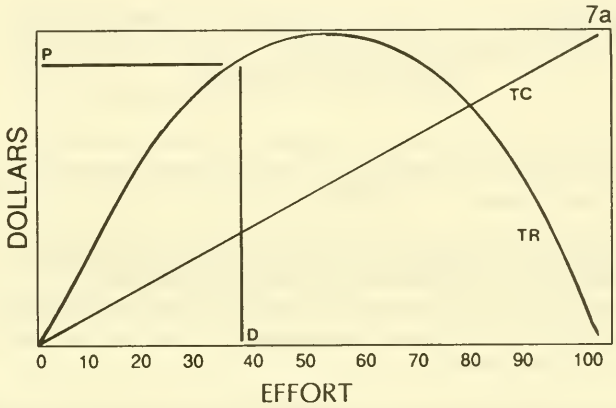
Profit is the difference between costs and revenues. Therefore, profit maximization, as shown in Figure 7a, is the level of effort that produces the largest difference between the TC curve and the TR curve. That level of effort is achieved at point D*, which is to the left of maximum sustainable yield. The point of maximum profits at the left of maximum sustainable yield has some intuitive appeal if we consider that, at larger stock levels (which is what lower levels of effort imply), fish are easier to find and the relative cost of catching fish is reduced. The economically efficient long term catch in a sole owner model will, under most conditions, land us on the left side of the maximum sustainable yield where there are lots of fish and lots of profits to be had from catching them.

Taking the sole owner outcome as the "optimal," or most economically efficient, scenario that can be achieved in the fish market, we can go on to look at some real world policies that have been proposed and/or applied to these markets in an effort to reduce the overfishing that modern technology and economic incentives lead to in an open access fishery. We can use the sole owner outcome as a stand-

Figures 7a and 7b

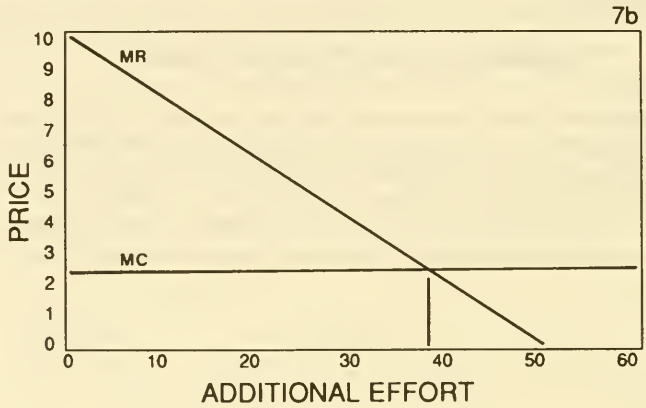
Optimal Outcome for a Sole Owner

Figure 7a shows much the same story for the sole owner fishery as did the Total Revenue/Total Cost graph (Figure 1a) for the individual farmer (except that here the input is fishing effort). The profit maximizing level of effort can be shown in the sole owner graph as the maximum difference between total costs and total revenues (as long as revenues are greater than costs). If certain reasonable conditions



ard against which to measure these other policies. We will also note what sort of information would be necessary to institute each policy, and we will discuss some of the enforcement problems that each might entail.

By looking critically at the problems that have been discussed above, we can predict the sorts of policies that might improve the overfishing problem. If we agree that the "overfishing problem" entails too much effort pursuing too few fish—and that this implies depleted fish stocks and too many fishermen with too much capital invested in gear—and if we agree that people cannot positively affect fish production ex-



are met, the maximum difference between costs and revenues is always at the point where the slope of the TR curve is the same as the slope of the TC curve.

The marginal revenue curve in a graph of marginal costs and marginal revenues (Figure 7b) shows that this gives us the same "optimal" outcome. The MR and MC curves in the graph below show the point at which the revenue from more effort does not cover the cost of employing that effort.

cept by catching fewer fish, then the only way we can control overfishing is by limiting catch. There are any number of ways in which this can be done, but the general categories are these:

1) Restrict the number of fishermen working a fishery, since one of the reasons many open access fisheries are overfished is precisely that anyone who wants to can catch fish.

2) Limit the period of time over which fishermen are allowed to catch fish in order to spread reduc-

tions equally among fishermen but not reduce the number of fishermen.

3) Restrict the technology that fishermen are allowed to use since technology is what allows fishermen to overfish.

4) Give landing quotas to fishermen that would limit the total quantity of fish that could be caught.

5) Tax away the profits that motivate overfishing since it is pursuit of profits that leads to the inefficient outcome.

LIMITING ENTRY IN THE FISHERY

Let's consider two different policies for administratively controlling fishing effort. They have in common the strategy of attempting to directly control fisherman behavior by enforcing rules that restrict fishing effort.

Fishery managers could limit the number of fishermen fishing a given fishery by requiring licenses and by only providing a certain number of these. By limiting the number of people who can catch fish, one would expect to reduce catch at some point. But, if we think about this policy in terms of our model of self-interested fishermen, we can reasonably expect that the remaining participants would increase the scale of their catch efforts (or, improve their technology) until the market returned to the inefficient right hand intersection of total costs and total revenues.

An example of this response by fishermen to entry restrictions is the British Columbia salmon fishery. There, managers reduced the number of licensed vessels by 20 percent, but these vessels were then replaced by bigger and better vessels that actually increased the capacity of the fleet.

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There might be some point where, if few enough boats were allowed to fish a fishery, some dis-economies[5] of size would eventually keep the remaining participants short of the open access equilibrium. But, if the remaining fishermen were allowed to increase individual effort and change their technology, it would be extremely difficult for fishery managers to accurately equate the optimal number of fishermen with the optimal catch. And, if managers applied gear restrictions along with entry restrictions, fishermen would only exaggerate other aspects of their capacity to overcome these restrictions so that a cycle of regulation, capacity enhancements, and more regulation is set in motion.

There would be some fairness questions to such a policy, especially if it landed the industry back at the point where the open access policy did (except with fewer fishermen). But there are some politically attractive aspects to entry restriction. A licensing policy could be a fairly painless, long term mechanism for achieving reduced fishing effort if it "grandfathered" current producers. Under such a policy, participants in the fishery would have the right to continue fishing up to some point in the future (maybe until retirement), but would not be able to pass on this license to anyone else. Fisheries managers could then control the number of fishermen participating in the industry through attrition and controlled replacement.

How fishermen and potential fishermen would compete for licenses would be the next problem. Lotteries may seem the most fair, but economists would likely propose an auction.

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[5] Economies of size occur when cost efficiency is improved by increasing the size of the production unit. At some point, however, greater size starts to reduce efficiency and this reduction in efficiency due to increases in size is called "dis-economies of size."

Under a lottery, those who might be more effective fishermen and those who might not take it so seriously would both have an equal chance to win the license. Under an auction, the license would go to the highest bidder who, presumably, is the one who values it most highly. In either event, there would be fewer individual fishermen under a restricted entry scheme than under most other policies because limiting effort by limiting the number of fishermen provides an incentive for larger scale operations.

SEASONAL RESTRICTIONS

Another way of reducing fishing effort would be to reduce the amount of time during which fishermen are able to catch fish, that is, by reducing the season. If fishermen only catch so many fish a day, and if our model tells us what optimal level can be sustained over time, then we just divide the total allowable catch by the total catch per day and that gives us how many days in our season. This approach has, in fact been used fairly extensively by fisheries managers.

When we look at it carefully, however, reduced seasons are almost as difficult a mechanism to use as limiting the number of fishermen. If the number of fishermen are reduced, then each fisherman will expand his efforts until his marginal costs of catching another fish equals the value of that fish in the market place—i.e., fishermen will continue to fish away the rents. Similarly, if the amount of time over which fish can be caught is reduced, then fishermen will pack greater effort into that shorter period of time. Restricted season policies induce fishermen to fish around the clock in a manner that is both dangerous to fishermen and inefficient for society. The predictable behavior of fishermen—there are still profits to be made—makes it extremely difficult for the fishery manager to get back to some specific, desirable level of reduced effort and higher stocks.

TECHNOLOGY AND GEAR RESTRICTIONS

Another means of controlling catch is limiting technology. This policy has also been applied by fisheries managers. In the case of salmon fishing in the Yakutat region of Alaska, regulations allow only beach set nets. These nets are hauled in by hand from the shore, requiring more effort than mechanized gear (although the fishermen can still supplement their fishing with technologically advanced gear, such as radar for locating fish). Restrictions can be an effective way to protect stocks against the unbridled use of an improved technology, but it does not necessarily achieve a more desirable outcome for fishermen or fish consumers.

The way that we would show the economic effect of a technology restriction is by graphing total costs and total revenues under the two different technology scenarios. Figures 8a and 8b show that technology restrictions might avoid greater stock depletion. One must be careful in making generalizations because different sets of empirical data will give us different outcomes (i.e., there are any number of ways to portray these graphs unless one has empirical data). For instance, whether the fishery was already being overfished or not would help to determine whether moving from the existing outcome to the economically-optimal-under-new-technology outcome would result in more or less fish being supplied in any period. But one generalization that can be made is that the catch level obtained under a restricted technology could be obtained with fewer economic resources if the new technology were allowed, and *if* one could restrain catch to an optimal level.

Technology restrictions tend to increase the danger in fishing. However, they are sometimes attractive to fishery managers because preventing change is typically easier than imposing change. They are, by definition, technologically inefficient, but, as we have shown in the graph, they can conceivably prevent a reduction in the long term supply of fish.

Figures 8a and 8b

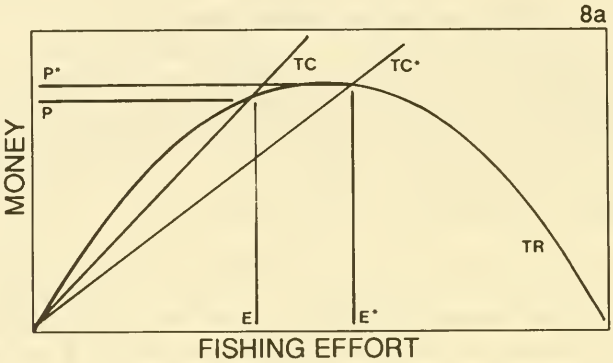
Effects of a Technology Restriction

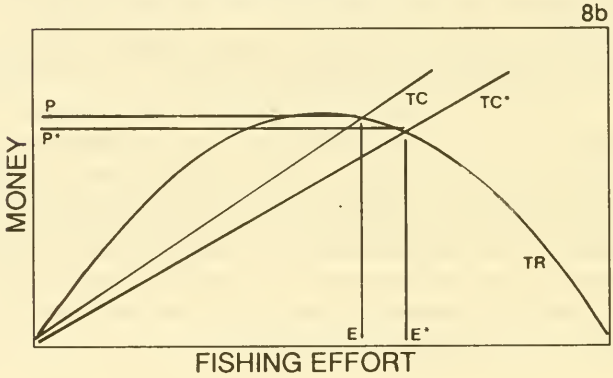
Unlike the example given in Figure 5b that showed how a technology improvement could move catch in a fishery over to the inefficient side of the effort curve, this example assumes that the technology improvement only reduces costs and does not result in more fish being caught for the same amount of effort. This means that the maximum revenue curve stays put and the cost curve pivots downward.

In Figure 8a, the industry was not overfishing the fishery in biological terms before the technology improvement. With the technology improvement (represented by the TC^* line), the industry suffers under an incentive to overfish stocks because the cost per unit of effort has gone down. However, more fish are delivered to the marketplace than were delivered under the old technology. Thus, a technology restriction in this case, while keeping the industry from biological overfishing, will also restrict the amount of fish delivered to market.

In Figure 8b, the industry was already overfishing the fishery before the technology improvement (curve E). With the improvement, the lower cost of fishing effort encourages fishermen to overfish to an even greater degree (curve E^*), thus reducing the quantity of fish delivered to market. If a stock is being overfished, a technology improvement in an open access setting will invariably result in less fish being brought to market over the long run. In this case, a technology restriction will result in more fish supplied over the long run.

Gear restrictions such as net size and vessel size can also be effective ways to limit catch. Limiting catch by regulating allowable mesh size changes some of the original underlying assumptions about the catch curve in our biomass model, since such a policy would bias the catch (and, thereby, stocks) toward a certain size class of fish. Whether this increased or decreased productivity of a given fish population would depend on the reproductive biology of the species. It is, in fact, very difficult to compare this policy in general to





our economically optimal outcome without first specifying the biological outcome of the policy.

Rather than hypothesize various biological outcomes, we can satisfy ourselves that, while mesh size restrictions might prevent further degradation of a fish stock and might even improve stock levels, there is little reason to expect this policy to move us toward the economically efficient level of either effort or catch. It does not bring about a more efficient level

of effort because mesh size restrictions merely limit the available resource to the larger size classes in the fishery. Economic incentives and conditions are not otherwise changed so we should still expect too much effort to be expended pursuing this reduced, but still profitable, resource. And gear restrictions could not be expected to bring about more efficient catch levels because it would be practically impossible to equate maximum mesh size to the optimal stock size for the fishery.

Gear restrictions such as mesh size limits also entail considerable enforcement problems. If a single vessel is fishing several different species, then it might need to carry different nets for its different enterprises. If the regulator allows the vessel to carry different net sizes, it becomes very difficult to enforce restrictions for the regulated fishery.

Other gear restrictions, such as net length limits have been proposed for some ocean fisheries. Such restrictions address the more blatant abuses of some fishermen but, like mesh size limits, they do not provide a very precise instrument for obtaining an optimal catch level. In some cases, such as longlining, the objective of the policy is not to drive resource allocation outcomes to some optimal level so much as it is to stop an abuse. Gear restrictions and other policies attempt to directly control fishermen's behavior. We will now look at some of the less direct, economic means for controlling catch levels.

LIMITING CATCH WITH QUOTAS

The most severe form of a quota system is a moratorium, or ban, on fishing. Under a moratorium, no one can land any of the restricted fish and everyone's quota is zero. A moratorium was recently placed on the striped bass fishery in some of the Atlantic Coast states. While this measure seems to have allowed an impressive rebound of striped bass stocks, it has created disruption for both recreational

and commercial fishermen, not to mention consumers. It also provides an example of the "free-rider" problem wherein some states, most notably Virginia, did not join the moratorium, yet their fishermen benefited from the fact that most states stopped fishing striped bass and stocks revived. Free riders are a problem if fish stocks travel through areas that are able to opt out of the management plan.

There are two fundamental questions attending the quota policy: how big should the total catch be, and how should the quotas be allocated? The first question is answered by the graph of catch under the sole owner scenario in Figure 7. If economic efficiency is desired, then the optimal level of effort is the one that maximizes the difference between total costs and total revenues for the fishery. The quota, or total allowable catch, should be one that returns stocks to the left side of maximum sustainable yield where profits are maximized. If biological efficiency is the objective, then the optimal catch level is the one associated with the maximum sustainable yield, because that catch level defines the maximum productivity of the fishery.

The second fundamental question in the use of catch quotas is how to allocate them. This question has important ramifications for economic efficiency as well as fairness aspects of the policy. The simplest way to implement a quota would be to announce the quota at the start of the season and then close the fishery after that many fish had been landed—regardless of who brought them in. In fact, this method has been most commonly used by fisheries managers. But, while it is easy to implement, it has the same effect on fishing effort as limited seasons. It encourages fishermen to use bigger boats and better technology and to work around the clock so as to be the first back to port with full holds.

Another approach to quotas, and one that takes into account fishermen's economic incentives, would be to decide on a total allowable catch and to allocate catch quotas among fishermen. These individual quotas could be allocated according to each fisherman's contribution to total catch before the quota came into effect (based, for instance, on some three-year average for each fisherman and total catch for that year). Or, alternatively, equal quotas could be allocated to everyone who wants one so that the size of each individual quota would be determined by dividing the total allowable catch by the number of quotas granted. Another method might be to auction quotas, so that whoever valued them most highly would win them.

If a quota is binding in that it constrains fishing effort, any allocation system will afflict some fishermen since reduced effort implies that some fishermen, at least, will be catching fewer fish over the short run. One way to mitigate the imposition on fishermen would be to provide quotas to fishermen and to then promote the free trading of them. If quotas were tradable, a market could be expected to develop in which quotas would be bought and sold. The quota would represent the right to catch fish and that right would have value to fishermen. Fishermen who wanted more quotas would be willing to pay a price less than or equal to the discounted returns to catching as many fish annually as allowed under that quota. Obviously, some fishermen would be quota buyers and others would be quota sellers. Thus, along with the boat and gear that anyone leaving the industry would want to sell, fishermen would possess another source of value in their quotas.

If quotas, no matter how they are originally distributed, are tradable, then the profits to the fishery will accrue to the holder of the quota. It could be expected that quotas would be gathered by the best fishermen, because the best fishermen would value them most highly and would pay the

highest price for them. Less successful fishermen would be less able to absorb the shock of reduced allowable effort and they would be the sellers of quotas. On the other hand, if quotas are not tradable then a larger number of fishermen might choose to stay in the fishery, since there is no additional value attached to getting out. Informal markets for catch quotas might develop that would impose regulatory avoidance costs on operators in the market.

Along with the fishermen, fish consumers would also experience a reduction in economic welfare if catch were reduced for a time. In the long run, economic welfare for both consumers and producers will be larger than that attending the overfished, open access fishery. But if fishing effort has depleted stocks, and effort has to be reduced to get stocks back to a more productive level, then both consumers and producers as groups will forfeit some welfare in the short run. Economists try to measure these losses and compare them against gains in producer and consumer welfare over the long run and they have posited some very interesting interpretations of scarce data with such studies. Unfortunately, these studies are seldom made accessible to the general public.

In cases such as the North Pacific crab, shrimp, and pollock fisheries, where effort is very likely greater than the long term maximum sustainable yield, but stocks are not yet drastically reduced, it is painful to watch the unfolding scenario in which the industry continues to invest in boats and gear that will soon drive stocks of shrimp and pollock into a depleted state, reducing catch and demanding possibly drastic solutions. The further stocks are depleted, the greater the pain will be attending any "adjustment," whereby fishing effort is brought into line with what is biologically sustainable and/or economically efficient. If a quota system were introduced before stocks were severely depleted, then the pain of adjustment would be much less. But, in the absence of a

believable production function for the fishery at different stock levels and different catch levels, is it necessary to go "over the edge" with catch levels so that we know how much is too much?

TAKING AWAY THE PROFITS

As we have said, nobody—or everybody—owns the fish. In the absence of any rule to the contrary, the rents accrue to whoever goes out and catches them. We have already seen why, in an open access setting, this leads to an inefficient and undesirable result. But, what if all of the people (or the majority of the people, or a benevolent dictator), acting through government institutions decided that the rents to a fishery should accrue to fisheries management programs, or, perhaps, more broadly, to environmental management programs? The way to do this would be to impose a landing tax on all the fish brought to market.

A tax on landings would act like any excise tax, and would reduce the amount of effort spent on fishing. The effect of a tax can be viewed—as in Figure 9—as an increase in fishing costs. This increase in costs would lead to a reduction in total effort (though over the short term a perverse outcome could prevail in which fishermen worked harder to catch more fish so that each one's net revenue stayed the same). How quickly to try to restore stocks to their optimal level is very much an issue, as it is for any policy that tries to increase stock levels. But one could, in theory, set a tax rate that over the long run allowed fishermen a reasonable return on capital and that restrained fishing effort to levels where producer and consumer welfare were maximized according to market efficiency.

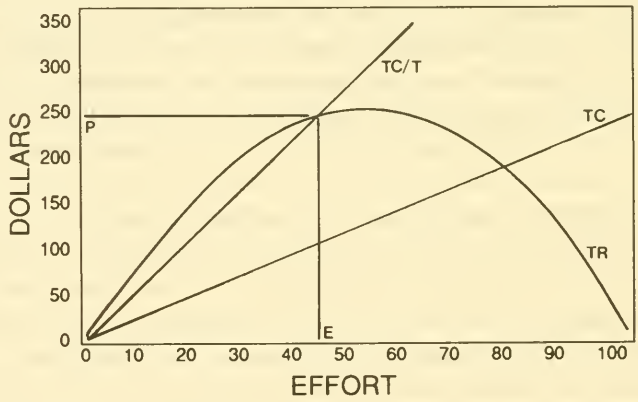
A significant difference between optimally set tradable catch quotas and an optimal landing tax is that the fishery rents would, in the latter case, accrue to the government, whereas in the case of tradable quotas, rents would accrue to

Figure 9

Effects of a Tax on Fish Landings

Graphically, a tax on landings (also called a royalty) is either a shift up or a pivoting upward of the industry total cost curve. If the tax is a fixed amount per unit landed, then the total cost curve shifts up. Figure 9 shows a sliding scale tax that increases with increased landings. In either event, along with all of the other costs of catching fish, fishermen would, under a landings tax, have to bear the additional cost of a charge for fish landed. An economically optimal catch would be obtained by raising the marginal cost of catching fish so that he would have no incentive to fish past the socially optimal catch.

Consider the application of a tax that raises the cost of fishing so that the industry total cost curve intersects the total revenue curve at the economically optimal point "P" as in the graph. Income will be lost if fishermen fish beyond this level of effort, so they probably will not do it, or they would not be able to do it for long. The rents to fish would accrue to the government.



whoever owned the quota. Such a tax would have the same efficiency effect as tradable quotas in regard to who stayed in the fishery—the productive fishermen. (Some fisheries have a landings tax, but it is for the purpose of increasing revenue for the taxing government, not for deterring people

from entering the fishery or forcing people out.) Less productive fishermen would not be able to continue fishing if the tax constrained total available revenues and they were competing with more productive fishermen. Less effective fishermen would not be able to compete and would be displaced, leaving behind only the most efficient fishermen. A tax would also provide an incentive for technology improvements, since they would have the appearance of reducing costs and enlarging profits in the short run. Such technology improvements would therefore require constant adjustments of the landings tax, in order for the optimal catch outcome to be maintained.

Fishermen would not likely want to start paying for something that has always been free. And they may not trust the government to set the tax properly. All of the information that would be necessary in the case of establishing the (economically) optimal long term total catch quota—associating different levels of effort with costs, stock levels, market prices, technology, and catch—would still be necessary. But rather than telling fishermen how many fish can be caught per quota holder, the fishery manager would—under a landings tax policy—determine how much tax the industry could bear and still bring the economically optimal amount of fish to market. Over most of the 1980s, voters in the United States have elected to restrict government's share of society's economic resources. This has resulted in the government's inability to provide some services that for one reason or another, cannot be supplied by private enterprise suppliers, including fisheries management and information services. None of this bodes well for proponents of a landings tax.

Conclusion: So Why Do People Catch Too Many Fish?

People catch too many fish—according to the economic view on the matter—because the fishery is treated as a free good to which everyone has access. Some fishermen will do better than others and make profits, others will barely cover their operating costs and limp from season to season. None of them has an incentive to reduce their fishing effort. In the long run, that setup, coupled with an ever increasing technological capability, leads to catch levels that overwhelm nature's ability to replace fish stocks. It is not happening because of excessive greed on the part of fishermen, it is happening because that is the system equilibrium under the current (open access) setup. If someone owned the fish, or if a single entity controlled fish catch levels, the system equilibrium would be different.

There was a time when fish could be treated as a free good. At that time, fishermen's capacity to catch fish did not outstrip nature's ability to replenish fish stocks. Those days are largely gone. The days of less efficient fishing can be legislated by restricting technology, or imposing limits on the time or effort that fishermen can apply to any fishery can reduce catch. Or, managers can take an economic approach of somehow pricing the resource. Whatever the management strategy, it is important to recognize the market failure in open access fisheries.

The National Marine Fisheries Service is now more aware than ever of the potential and need for limited access management of our nation's marine fisheries. Several fisheries, such as wreckfish in the South Atlantic region and the mid-Atlantic surf clam fishery, now work under an Individual Transferable Quota (ITQ) system. The South Atlantic Fishery Management Council is looking into limited entry schemes for other reef fish species of the deep water complex, and the North Pacific Fishery Management Council is designing a quota system for sablefish. In 1991 the Pacific Fishery Management Council adopted license limitation for

managing and conserving stocks of Pacific Coast groundfish, and examples of seasonal closures are the shrimp fisheries of the Gulf of Maine and Gulf of Mexico. Canada, New Zealand, and Iceland have also implemented ITQ and other limited access programs.

Now is the time for open debates on new ideas for fisheries management and careful examination of case studies, both successes and failures, because the Magnuson Fishery Conservation and Management Act will be reauthorized by Congress in 1993. This is an opportunity to move the Act from its original emphasis on development of U.S. fisheries and traditional management measures to allowing the implementation of more progressive schemes. The Act currently does not provide a mechanism for income from taxes, fees, or rents to accrue to the conservation and management of the resource. Furthermore, although the Act requires the consideration of maximum sustainable yield and the economic wellbeing of the nation's fisheries, it has yet to consider the long term view. There has never been a more critical time for the government and the American public to engage in a constructive dialogue concerning the overexploitation of our living marine resources, the conservation of the ocean's productivity, and the sustainability of the livelihoods it supports.

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Glossary

Carrying Capacity

In general, the carrying capacity of an ecosystem is the maximum number of a given living species that can be supported, given physical and biological constraints within that ecosystem.

Economic Efficiency

Economic efficiency implies that a given good or service is supplied in a least-cost manner, given current technology. An economically efficient range of effort is the range of input use over which the marginal costs of production are rising more slowly than the marginal revenue generated from production. In other words, there are still profits to be gained from adding one more unit of input, or production.

Equilibrium

Equilibrium, or balance, is a state toward which a given process tends over time. In the fishery, human activity can disrupt this equilibrium by taking more fish than can be replaced through natural processes.

Long Run/Short Run Equilibria

In the short run, some aspects of the production process are fixed (i.e., stock size, capital stock of the industry.) In the long run, change

can happen, and fixed inputs become variable. Thus, in the short run, the equilibrium harvests that are attainable given a certain amount of fishing effort may be greater than the harvests that are sustainable in the long run due to factors that are slower to react to the short run level of effort, such as environmental degradation and fishing above maximum sustainable yield.

Marginal Costs/ Marginal Revenues

Another word for marginal is "incremental." One can measure results in terms of the costs of achieving them. The marginal cost curve illustrates how much output each additional unit of input will yield. At some level, an additional (incremental) unit of input will not result in the same increase in output as did the previous units of input. Marginal revenues (or marginal returns) indicate how much additional output will be produced by an additional unit of input. Again, at some point, an additional unit of input will not yield as much additional output as the previous units. Eventually the marginal costs will be greater than the marginal revenue where adding additional input costs more than the resulting additional output.

Maximum Sustainable Yield (MSY)

MSY is the greatest amount of a resource that can be exploited

without running down stocks over time. MSY is determined by the available amount of the resource and the rate at which those stocks are able to replicate themselves. For most fisheries, the amount of fish that can be taken from the ocean in a sustainable manner—the maximum sustainable yield—depends primarily on stock size, rate of reproduction, and longevity.

Natural Resource Rents Natural resources are renewable resources that have a value in both current and future consumption. Natural resource rent is the value of the resource after all costs of bringing it to market are subtracted. In other words, rent is profit.

Open Access Fishery An open access fishery is one in which anyone who wishes can fish. Even when licenses are required, if the number of licenses is not limited and the holder does not have to abide by quotas or other restrictions to access, the fishery is still an open access resource.

Production Function (known on a graph as the production curve) In production, the amount of output generated depends on, or is a function of, the amount of inputs utilized. Production can be represented as a mathematical formula that predicts the output for varying levels of input use.

Total Cost/Total Revenue Curves

The total cost curve is the curve on a graph of costs versus output that shows the total costs that can be anticipated for any given level of output. Similarly, total revenues are shown by the total revenue curve, which is graphed over revenue versus output. Since revenues and costs are both denominated in dollars, and since both are graphed against output, both curves can be shown on the same graph.

Variable Costs

In most production processes there are fixed inputs and variable inputs. Fixed inputs are constant. For example, a fixed input in the production of wheat is land. Variable inputs are not constant. In the wheat production example, they would include inputs such as fertilizer and labor. The costs associated with variable inputs are variable costs.

UNITED STATES DEPARTMENT OF COMMERCE
The Under Secretary for
Oceans and Atmosphere
Washington, D.C. 20230

Mr. Roger E. McManus
President, Center for Marine
Conservation
1725 DeSales Street, N.W.
Washington, D.C. 20036

Dear ~~Mr. McManus~~: Roger,

Thank you for your letter regarding individual transferable quotas (ITQs) and their relationship to property rights. I welcome the opportunity to clarify our views on ITQs and other controlled access management systems.

To respond directly to your question, this administration does not advocate privatization of public living marine resources. The establishment of ITQs does not confer private property rights, nor do holders of quota shares own the resource. Rather, this type of fisheries management distributes transferable harvesting privileges of the allowable yield specified under a fishery management plan (FMP). An ITQ will necessarily have some characteristics and advantages of private property since holders of shares can treat them as a negotiable instrument that can be bought, sold, or leased. But ownership and control of the resource remains in the public sector.

Our goal is effective stewardship of fisheries resources. We are comfortable that full public control of fishery resources will be exercised through the Regional Fishery Management Councils in the preparation of FMPs. Under FMPs, the Councils can propose ITQ systems as a means to provide efficient management of a specific fishery, but the FMPs will regulate the amount of fish that may be harvested under the ITQ. They may also contain other, traditional conservation measures, such as spawning area closures. Thus, substantial Federal control over the public's fisheries resources will be exercised even when market-based management regimes, such as ITQs, are implemented. The Councils are encouraged to consider the full range of management systems to optimize economic and social benefits of fisheries under their jurisdictions.

We agree with your point about the need for NOAA to clarify distinctions between property rights and harvesting rights. We are actively seeking opportunities to ensure that all our constituents understand the difference between these confusing terms. Updates of the NOAA Strategic Plan will delete references to property rights in favor of the intended expressions "harvesting rights" and "harvesting privileges."

THE ADMINISTRATOR

We also share your concern about assigning harvesting rights at no charge under ITQs. However, there is currently no authority under the Magnuson Fishery Conservation and Management Act to collect rents or other user fees. We welcome continued dialogues with the Center for Marine Conservation on rents and on the assessment of special fees to pay the heavy costs of administering controlled access fisheries.

I appreciate your interest in this important matter and look forward to your continued support of NOAA's conservation efforts.

Sincerely,

Jim

D. James Baker

Doxsee Sea Clam Company, Inc.

TELEPHONE: 516-432-0529

BAYSIDE DRIVE
POINT LOOKOUT, N. Y. 11569

February 16,1994

U.S. House of Representatives
Committee on
Merchant Marine and Fisheries
Room 1334 Longworth House Office Building
Washington, D.C. 20515-6230

Honorable Thomas J. Manton, Chairman

Dear Sir,

Please allow my comments on the ITQ system of managing the surf clam fishery to be entered into the record.

My company harvests and processes surf clams on Long Island, N.Y. My family has been engaged in this activity since 1944. At present, the clams we are harvesting are from N.Y. state waters.

In addition to the problems created by the ITQ system my largest complaint was the lack of foresight by the powers that be in regard to what would happen to the dozens of sea clam vessels surplused by Amendment 8. The scheme allowed for transfer of ITQ allocation onto fewer vessels which was supposed to reduce 'OVERCAPITALIZATION' in the fishery. Instead of so doing Amendment 8 caused the transfer of fishing effort from one area to another.

By a strange combination of circumstances, the implementation of Amendment 8 coincided with a virgin set of sea clams within the territorial waters of New York state. Where there were upwards of five vessels harvesting in the Atlantic Ocean waters of New York, now there are twenty seven. The owners of these boats received a virtual subsidy not to fish their boats in the form of ITQs. They were not satisfied with that but invaded the waters of N.Y. state to make a quick killing. The regulators of N.Y.even though familiar with amendment 8 and even had a seat on the Mid Atlantic Council and voted for Amendment 8, did nothing to forestall this invasion and even encouraged it.

It goes without saying that the vast increase in the fleet has created vast hardships on the traditional sea clam harvesters of the state. This is only one negative impact of Amendment 8, but a very serious one for my company.

Very truly yours,

Robert Doxsee

Robert Doxsee

Queen Anne Fisheries, Inc
1939 Eighth Avenue West
Seattle, Washington 98119
(206) 284-9158

F/V MASONIC
Mark S. Lundsten, Operator

1/24/94

The Honorable Thomas Manton, Chairman
Fisheries Management Subcommittee
Merchant Marine and Fisheries Committee
534 Ford House Office Building
Washington, D.C. 20515

Dear Chairman Manton,

I am writing to thank you for attending the meeting in Seattle on January 17 with Mike Lowry, Jolene Unsoeld, Maria Cantwell, and members of our fishing industry. I appreciate the willingness of you and of our state's delegation to work with fishermen in order to figure out our problems.

I am the owner/operator of a longline vessel, the Masonic, am a Trustee of Fishing Vessel Owners' Association in Seattle, and have been an active participant in the campaign for the IFQ system now being implemented for the sablefish and halibut fisheries. Believe me, we all look forward to fishing under that system in 1995.

In the last year I also have become involved as a "volunteer" Board member with a different group of fishermen - Independent Fishermen For Fair Quotas (IF^3Q), a group of trawl catcher-boats, crabbers, freezer longliners, a factory trawler, and a processing mothership. Most are members of either United Catcher Boats, Alaska Crab Coalition, or the North Pacific Longline Association.

Since early December, I have taken on the duties of Director for IF^3Q until I go back fishing later this spring.

In that time, we plan to work as much as possible for an IFQ plan for groundfish and crab for the North Pacific fisheries still under open-access management. More a joint campaign than a traditional fishermen's organization, we plan to work as long as necessary with as many fishermen as we can to help develop that plan.

The passage of the halibut and sablefish IFQ program is a credit to our fisheries management system. I hope we can work out another system for crab and for the other species of groundfish in the North Pacific.

Sincerely,

Mark S. Lundsten

INDEPENDENT FISHERMEN FOR FAIR QUOTAS
2442 Northwest Market Street #349
Seattle, Washington 98107
Phone (206) 283-2994 or 782-0770
Fax (206) 282-6175

January 24, 1994

Richard B. Lauber, Chairman
North Pacific Fishery Management Council
P.O. Box 103136
Anchorage, Alaska 99510

Dear Rick,

I am writing to express our disappointment with the recent decision by the NPFMC to prioritize license limitation for the groundfish and crab fisheries in the North Pacific.

Over 80% of the production capacity, including processors, testified both to the Council and to the Advisory Panel that the 14 problems facing the groundfish and crab fisheries in the North Pacific identified by the Council would be substantially addressed by an IFQ system and would not be addressed by license limitation. In fact, fisheries management history shows that license limitation will exacerbate the race for fish and its concomitant snarl of over-capitalized vessels and plants and will worsen most of those problems we are trying to solve.

Public testimony at the last two meetings by members of IF^{3}Q, United Catcher Boats, the Alaska Crab Coalition, and the American Factory Trawlers Association has especially highlighted that point. Plus, members of the Pacific Seafood Processors Association have spoken almost exclusively at these meetings about the kind of IFQ sytem they want the Council to develop.

Not too long ago, an Alaskan Council member went on record in favor of IFQs primarily because of safety concerns. Now that position has changed. Another Alaskan has testified that we need to establish a reasonable management system for conservation and economic reasons, for both the fleet and for coastal communities, with IFQs. That too has changed. Another Council member has always said he wants to see the whole of the fisheries rationalized at one time with an IFQ system. Now that he has had the chance to do that, he has changed his mind. We are frustrated.

IF^{3}Q's position is clear: we want IFQs for groundfish and crab and we want the original allocation to be based on historical participation. The pioneers of the fisheries, those that got those fisheries off the ground, should be allowed to continue in a reasonable fashion.

The Council's recent decision to "fast-track" license limitation is a slap in the face to those of us who have committed ourselves both to the business of fishing and to an honest stake in the Council process.

Testimony has been given by a credible and legitimate majority of the industry's investment and fishing power that IFQs will help solve the crisis we are suffering. We have stated clearly how

license limitation will not help. When the Council rejects this kind of advice from industry, I seriously have to question the Council's legitimacy.

I made it very clear in my own testimony that the industry is willing to negotiate the complexities of an IFQ program among themselves. We will try to do the dirty work. We will try to figure out some kind of system for ourselves. We have to. Just as the halibut and sablefish fishermen have done (and I speak from personal experience).

The members of IF^{3}Q are not going to quit. But we do not trust the Council to act in a sensible fashion on this issue. We will negotiate our position with the rest of our industry as best we can and we will pursue our goal, the same goal that the Council should have, in whatever avenue we are forced to take.

No one can be blamed for the current state of our business. But the Council is to blame for impeding the solution to the problem. Studies of license limitation are only slogging down the process of making sane the dangerous and financially perilous business of fishing in the North Pacific.

On the record, almost every major user group has testified to their committment to working out a solution. The Council at this point is only in the way.

Sincerely,

Mark S. Lundsten

cc: Secretary Ronald H. Brown
Mr. Douglas K. Hall
Mr. Rolland A. Schmitten
Governor Mike Lowry
Mr. Robert Turner
Senator Patty Murray
Senator Slade Gorton
Representative Thomas Manton
Representative Jolene Unsoeld
Representative Maria Cantwell
Representative Jim McDermott
Representative Norm Dicks

Fishermen's Finest

North Pacific Fishing, Inc.

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January 21, 1994

Honorable Thomas J. Manton, Chairman
Subcommittee on Fisheries Management
U.S. House of Representatives
H-2 513 Ford Building
Washington, DC 20215

RE: Rationalization of North Pacific Fisheries and Magnuson Act Re-Authorization

Dear Congressman Manton:

I enjoyed speaking with you at your reception in Seattle this week. I am writing to follow-up on our discussion My company, North Pacific Fishing, Inc. operates the F/V AMERICAN NO. 1 while our sister company PATHFINDER USA, Inc. operates the freezer longliner F/V PATHFINDER in the federally managed fisheries of the North Pacific. Our two companies are based in Seattle and employ approximately 175 people in Washington and Alaska. I personally have 46 years of experience in the fishing industry, 37 years of which were spent at sea. Upon removal of the foreign fleets from our waters, I created North Pacific Fishing to develop American at-sea processing capacity I have served as a member of several government advisory bodies including six years as a voting member, and as vice-chairman, of the North Pacific Fishery Management Council. As a Council member I always served as a representative of commercial fishermen, not of a particular gear type or specific market. I strongly object to the growing trend in which council members work toward their own immediate personal interests instead of working for their future by building a strong fishery for all participants.

The federal fisheries in the North Pacific are amongst the healthiest, best managed, and most productive in the world. Each of the over 30 fisheries in the North Pacific are regulated under a strict fleetwide quota. These quotas are set below the scientifically determined overfishing level. Regardless of the amount of effort, the National Marine Fisheries Service prevents these fleetwide quotas from being exceeded. Since the Americanization of these fisheries through the Magnuson Act, we have built the most accurate and complete fisheries database in existence under any government fisheries management authority. In the midst of this success, a group of individuals who are unable to compete in this business through lack of skill or vision are attempting to convince Congress that the Magnuson Act should be amended to require the government to give this multibillion dollar resource to them These individuals and organizations are attempting to sell this idea to Congress as a "market-based solution" to "overcapitalization." Far from being an equitable management plan, Individual Transferable Fishing Quotas (IFQs/ITQs) are nothing less than a plan to place public property in the hands of private individuals.

These groups claim broad-based support for their plan to solve our industry's problems. In making this assertion they ignore the fact that they have been unable to achieve consensus on the blueprint for IFQs even amongst themselves. Further, at this month's North Pacific Fisheries Management Council meeting, the Council and its Advisory Panel composed of industry and public representatives, voted to table the IFQ plan in favor of developing a license limitation plan, buyback program, and enhancing the current traditional regulations to reduce bycatch and waste in the fisheries. These votes underscore our assertion that there is no industry consensus supporting IFQs.

Prior to taking any action I strongly suggest that you review the testimony presented to the council by the public. Not only will you find the voices of the large lobbying organizations that support the give-away of the public resource, you will also find the testimony of private citizens who traveled to the council to voice their opposition to an IFQ plan. One young man testified that he was a third-generation fisherman and that he and his brothers had been completely disenfranchised from the halibut fishery due to not having followed the complicated political machinations which lead to the sablefish/halibut IFQ plan. The sablefish/halibut plan was approved by Commerce Secretary Brown last January amidst an intense Washington DC lobbying effort, not due to grassroots support

IFQs would create a fisheries management system that only very wealthy investors could afford to enter. Last year a much less restrictive limited-entry permit system was recently put in place by the Pacific Fishery Management Council which regulates the low-value whiting fishery off the coasts of Washington, Oregon, and California. Within one week after we received the permit for one of our small 101 foot catcher-only trawl vessels, we received an offer of $114,000 for the permit The value of a similar permit in the Canadian Pacific coast fisheries one and one-half years after the implementation of their limited-entry program was $700,000. If a limited entry permit system places this significant a burden on the fishing fleet, it does not take an economist to show that the economic value of an IFQ, which not only grants limited access but a specific share of the total annual harvest, is vastly greater than limited-entry permits. If a license limitation program is adopted, the option of having licenses revert to the federal government upon the licensee ceasing his or her involvement in the fishery.

The effect of an IFQ program would also be to greatly increase the bureaucracy and expense needed to manage our fisheries The current reporting system already requires many hours a day of our vessel operators' and office staff's time. The added burden of regulation and reporting already being looked into by the National Marine Fisheries Service (NMFS) staff would be staggering At a minimum NMFS estimates that each vessel would need to purchase a $75,000 plus scale system to weigh each fish harvested. The Scale industry has stated on the public record that scales meeting NMFS requirements do not even exist and will take years to develop. This is not a recipe for a simple program that reduces government bureaucracy. It is a recipe for enhanced government regulation and waste. Mr. Steven Pennoyer, the director of the Alaska Region of NMFS states that an IFQ program will not be simple and will entail at least a 10,000% increase in the number of individual fisheries his staff must manage.

The great financial value of an IFQ share combined with the security granted by the program would attract investors not normally interested in owning and operating fishing vessels. This program would thereby destroy the small and medium-sized fishermen and with them destroy the ability of our fishing fleet to respond to economic and ecological changes. None of us in the industry today are smart enough to know what type of vessels and equipment we will need to have to meet the conservation requirements of the future. By giving away a resource under an IFQ plan euphemistically called a "market-based solution" Congress would be destroying the dynamism of our fleet. It might also be giving our fisheries to the foreign banks which have underwritten many of the overextended factory vessels. Indeed, in the case of the Mid-Atlantic Council's IFQ plan, the majority of the IFQs are either in the hands of Borden, a major processing concern, and of foreign banks. A better method of managing the economics of the fishery is allowing the current truly market-oriented system to continue: the survival of the most efficient fishermen. The failure of investors who neither understand fishing nor are capable of safely managing a fleet without the government guaranteeing their financial security is capitalism working normally. It is the government's place to assure sound ecological management of the fishery, not to change the rules to choose the winners.

Giving away or selling the public resource is not the answer to our management problems; it is the answer for the economic problems and greed of a group of individuals and companies who made bad business decisions and who are not interested in the long-term viability of our newly Americanized fisheries. Even so, IFQs will not put more fish into the ocean, they will only create an asset that can be put on a balance sheet The Magnuson Act currently encourages maximum yield from the resource by providing public-access fisheries for which fees are not charged and exclusive rights to fish are not granted I urge you not to destroy the unique character of our fisheries by making them accessible only to very wealthy investors. Following the Commerce Secretary's 1992 Inshore/Offshore decision the price of pollock paid to shoreside delivery vessels dropped due to the fact that a small group of processors were the only customers in the world who could buy that fish by US law. IFQs, Processor Quotas, and auctions will only exacerbate these problems for the fishermen I do not advocate Congress writing the status quo into law, I am merely urging you not to mandate the drastic and crippling change from the status quo to solve the economic problems of a few businessmen and foreign banks who made bad business decisions

Sincerely,

Rudy A Petersen

Rudy A Petersen
President

cc: The Honorable Ernest F. Hollings, U.S.S., Chairman, Commerce Science and Transportation
The Honorable Gerry E. Studds, M.C., Chairman, Merchant Marine and Fisheries

Statement of United Catcher Boats

Submitted to:
The House Merchant Marine and Fisheries Committee's
Subcommittee on Fisheries Management

Washington, D.C.
February 9, 1994

To: The Honorable Thomas J. Manton,
Chairman House Merchant Marine and Fisheries Committee's
Subcommittee on Fisheries Management

From: United Catcher Boats
3040 W. Commodore Way
Seattle, Washington 98199

Dear Congressman Manton and members of the Committee;

United Catcher Boats appreciates this opportunity to submit testimony on the use of Individual Transferable Quotas as a fisheries management tool.

UCB is an organization representing over 50 trawler catcher vessels active in North Pacific fisheries. It is a new association which is the successor to American High Seas Fisheries Association and American Independent Fishermen, and also includes vessel owners who have not been members of the previous catcher vessel organizations. Our member's vessels range in length from 75 to 190 feet, and while they are primarily involved in groundfish in the North Pacific, many also participate in the Alaskan King and Tanner Crab fisheries and some are involved in the Pacific Whiting fishery as well. Most of our members, who are based in Alaska, Washington, Oregon and California, began operating in the groundfish fisheries in the late 1970's and early 1980's. Collectively we have harvested roughly half of all the groundfish caught by Americans in the North Pacific EEZ since the passage of the MFCMA.

Though we are a new organization we represent many of the pioneers of the North Pacific groundfishery. As such, we have watched and participated in the development of the largest and most valuable fishery in the United States. After struggling successfully to wrest control of the fishery from foreign fleets, it is a terrible disappointment to find our fishery has gone from boom to bust overnight. Yet this tragedy comes as no surprise. In 1987, before the harvest of groundfish was even fully Americanized, the North Pacific Fisheries Management Council foresaw the imminence of overcapitalization. The council appointed the Future of Groundfish (FOG) Committee to chart a course around these shoals. In doing so the council made a Statement of Commitment:

> "Expansion of the domestic fleet harvesting fish within the EEZ off Alaska has made compliance with the MFCMA's National Standards and achievement of the Council's comprehensive goals more difficult under current management regimes. The NPFMC therefore is committed to pursue alternative management methods that will support the Comprehensive Goals Adopted by the Council and achieve more productive and rational effort and harvest levels in the groundfish fishery."

The FOG Committee reported back, urging the Council to embark on a course of limited access to avoid the many problems associated with overcapitalized fisheries, not the least of which would be an un-ending series of allocation battles.

Unfortunately the Committee's report was set aside and the Council soon found itself floundering in the infamous "Inshore/Offshore" battle. This exercise absorbed

almost all the Council's energies for two years while the overcapitalization spiral continued unabated in all sectors. When it was all over no one had any real cause to celebrate. Rational management had retreated further than ever over the horizon, while the Council had attempted to bail out a sinking ship with a leaky bucket. When the Secretary of Commerce finally approved portions of the Inshore/Offshore decision, it was accompanied by the following directive:

"I urge the Council to work as expeditiously as possible toward some other method of allocating fish either than the Olympic system or direct government intervention. The Olympic system's race to the quota contributed substantially to the problems of overcapitalization, preemption of one sector by another, bycatch and waste."

The letter went on to urge the adoption of a market based system, as the best way to address the identified problems.

Our organization is, as it's predecessors AHSFA and AIF have been, committed to working with the NPFMC to develop and implement an Individual Quota system as rapidly as possible. However, after months of gridlock as the result of stalling and maneuvering within the Council, at it's last meeting the NPFMC pushed consideration of ITQs off it's priority list and moved to advance consideration of a license system.

A license limitation will do nothing to address the severe problems associated with the radical overcapitalization that has occurred in the North Pacific fisheries. The Council itself developed a Problem Statement over a year ago in which it identified fourteen problem areas which are symptomatic of the root overcapitalization crisis. Qualitative analysis by the Council and its staff indicated almost all these areas would be addressed by an ITQ system, while few if any would be resolved by a license program. Nothing in the record to date indicates otherwise, yet the NPFMC has voted to abandon the best hope to pursue the chimera of a license system which will do nothing to reduce overcapitalization. In doing so, we believe the Council has abdicated it's responsibility under the MFCMA to manage the fisheries placed in it's trust, consistent with the National Standards and for the maximum benefit to the nation.

It is for this reason we turn to Congress for assistance in finding a course that will lead to an expeditious implementation of an ITQ management system for the groundfish fisheries of the North Pacific EEZ. If the Council is unable or unwilling to carry out it's responsibilities to manage the fishery in such a manner that optimum yield is attained, then perhaps it is time for the Congress to direct the Secretary to develop a market based limited access management plan for the North Pacific fisheries.

As catcher vessels, the members of UCB are in direct competition with the catcher/processor sector. However, we share a common belief that ITQs hold the highest promise for rationalizing our fishery. We have reviewed the testimony being presented in person to your committee by Bill Orr, a factory trawler, and we agree in large measure with his assessment of the crisis confronting our industry. We have reached a point where the entire industry teeters on the edge of bankruptcy. The first wave of bankruptcies has already begun. The impact is not felt just by vessel owners, but by suppliers and crews left

holding the bag when an operation goes under. Unfortunately, these vessels are not going away, but are re-entering the fishery at cents on the dollar. This only intensifies the race for fish, with all the attendant problems: safety, bycatch, waste, allocation wars, and economic instability to name a few.

The crisis in the North Pacific will not be resolved until there is a reduction in the overcapitalization that results from the "race for the fish". Freezing the number of licenses will not reduce or even freeze capitalization, because it does not end the race for the fish. In fact the effective capacity of the fleet will inevitably be increased as harvesters find means of circumventing attempts to dictate inefficiency by regulation. This response, often referred to as "capital stuffing", has been experienced in every fishery throughout the world where license limitation has been adopted.

Under either open access or license limitation, the incentive is to maximize the production per unit of time, not to maximize the potential value per unit of fish. This aspect of the race for fish has several impacts. The most obvious is that it undermines the ability of the industry to produce value added products, as a result potential jobs are exported along with fish. This situation, where seasons grow shorter every year as the race intensifies, leaves US producers as price takers and gives foreign buyers the upper hand in glutted markets. Aside from the problem of all product arriving in the marketplace at the same time, the potential value is squandered when fish must be harvested before they reach their peak value, as a result of the race to catch fish before the quota is reached. These are just some of the ways in which the issue of waste of the potential of the fishery manifests itself under open access or license limitation.

Bycatch is another casualty of the race for fish that can only be properly addressed through a system of individual incentives. Currently, the bycatch of any given vessel is a cost which is borne by the fleet as a whole. No individual has any reason to clean up their performance, especially if doing so will slow down the harvest rate of their target species. Under a properly structured ITQ system each vessel must control quota for any species they harvest. If you have exhausted your quota of any given incidental species which you will catch in the course of pursuing your target fishery, you have foreclosed your opportunity to harvest the balance of your quota of your primary target species. This is the most powerful of all possible incentives for an individual harvester to fish as responsibly as possible, and it is built into an ITQ system.

We have spoken of waste and bycatch as figurative casualties of the race for fish. Unfortunately there is another literal casualty, and that is safety. Safety is effected in a number of ways, first because smaller vessels are confronted with the choice of fishing when the bigger boats fish regardless of weather. Second, because judgment suffers in the push to put in long hours in ever shorter, faster seasons. Some might argue that these are the consequences of individual choices, however there is a third perhaps more insidious impact on safety that is being felt across the fleet. That is the loss of a professional highly skilled workforce that has the experience necessary to work in the harsh environment at sea. This loss of experienced people is a result of the uncertain, shortened seasons that make it impossible to hold good crew.

We agree with the comments to your committee by Mark Lundsten, who represents another competing gear group, that ITQs "provide the opportunity for the industry to consolidate itself at optimum levels, an 'industry buy-back' with no need for any federal allocation of buy-out funds." Under an ITQ system those who choose to remain in the fishery bear the cost of buying out those who leave. While we are concerned that there should be some limits on consolidation of quota to prevent monopoly control of the fishery resources, some degree of reduction of effort is essential to restoring a healthy and manageable industry.

Up to this point our testimony had addressed the issue of the superiority of ITQ management to open access or license limitation. Another question that must be confronted is how and to whom allocations should be made under an ITQ system. Some have argued that the public interest is best served by an auction, and that fishers should not be given a public resource for free. While this argument seems to have merit on it's surface, bear in mind that under the open access fishers are also receiving the fish for free. The situation today is that the largest and most valuable fishery in the United States is being squandered. It is producing no rent (or in lay terms, profits) for the participants or net economic benefit to the nation. The costs of managing this tremendous public resource, which harvesters would be willing to share under an ITQ system, is a drain on the treasury under status quo. A direct allocation to those harvesters who have developed and are dependent upon the fishery is certainly no worse than status quo from a public perspective, but it does create a healthy and stable industry that in turn contributes to the tax base much more significantly than it does under open access.

UCB is willing to work in good faith with other sectors of the industry to develop consensus on an allocation formula, that is consistent with the principles embodied in MFCMA. This includes National Standard #4 that allocation be fair and equitable to fishermen. It also includes the intent language that accompanied passage of the Processor Preference amendment in 1979 that assured harvesters that they would not be put at the mercy of foreign or domestic processors, but would have access to open and competitive markets. There are ten points which we have identified together with other industry groups which we consider to be a basis for building an ITQ plan, which we have presented to the Council and which we are attaching to this testimony.

An additional concern that has been raised relates to is the privatization of a public resource. We want to clarify that what we seek form an ITQ management program is a long term access privilege to harvest fish, not the privatization of the underlying public resource.

It is the absence of a functioning market at the point of extraction of fish from the commons that is at the root of the problems confronting our industry and it is that root problem which is addressed by ITQs. The chaos inherent in the all too predictable "tragedy of the commons" can be reversed only through adoption of an ITQ management plan. We urge Congress to take the lead in implementing ITQs in the North Pacific by

working with the harvesting sectors to develop and pass legislation to end the deadly and wasteful "race for fish".

Thank you.

COMPONENTS NECESSARY FOR AN ITQ SYSTEM

The following proposal is the result of several informal meetings by vessel owners, including pot, longline and trawl interests, who shared their ideas about individual transferable quotas. Their intent was to find common ground on what components will have positive results for the resource, the fishery and the nation.

Any comprehensive plan that the council developes will come through a lengthy process. These vessel owners recognize that reality and are committed to the process.

THE PROPOSAL

An individual transferable quota system is the best hope of rationalizing a very irrational system. An ITQ system, however can be just as irrational as any other system if not properly developed. The following ten fundemental points are agreed as mandatory for an ITQ system:

I. The council and NMFS must retain their conservation and management roles.

II. ITQs are a right of access to a public resource, granted to the vessel owner at the time of allocation.

III. ITQs should be based on the total vessel catch history accrued between 1976 and June 24, 1992. *(This does not disallow weighting formulas based on JV/DAP mode or American ownership.)*

IV. No initial allocations should be made to anyone other than harvesting vessels.

V. Because the benefits of an ITQ program accrue over an extended period, the duration of the program must be considered perpetual, subject to periodic review.

VI. All species under Council jurisdiction should be included and treated by species assemblages where appropriate.

VII. ITQs should be granted for the area in which they were earned and used in proportion to the current subarea TACs.

VIII. Vessel catch histories for all non-PSC groundfish must be based on total catch. Initial allocations of prohibited species bycatch must be granted as part of the initial ITQ shares, and based on 3-year fleet average historical rates.

IX. ITQs must be fully transferable. There should, however, be a 2-year moritorium on sales of shares, with only leasing of shares allowed, to let the appeals process be completed.

X. Current laws and regulations should apply to ownership and limits on aggregation of ITQs.

FOLLOW-UP QUESTIONS FOR ROLLAND SCHMITTEN
FOR THE HEARING ON
INDIVIDUAL TRANSFERABLE QUOTA ISSUES
BEFORE THE SUBCOMMITTEE ON FISHERIES MANAGEMENT
COMMITTEE ON MERCHANT MARINE AND FISHERIES
U.S. HOUSE OF REPRESENTATIVES

February 9, 1994

I. QUESTIONS FROM REP. MANTON:

QUOTA ALLOCATIONS

Question 1: How do you believe quotas should be allocated and further how do we address the concern that current ITQ allocations amount to a federal give-away?

Answer: The method of allocation, including ITQ programs, should be considered and advanced, if appropriate, on a case-by-case basis by a Regional Fishery Management Council (Council). The role of the Federal Government is to lend its full support and technical expertise to ensure that such programs conserve the Nation's fisheries, address the needs of the industry, and meet the fair and equitable standards of the Magnuson Fishery Conservation and Management Act (Magnuson Act).

ITQ allocations are, in effect, a give-away, much like non-ITQ fisheries, because, at present, they are initially distributed without cost to the recipients. I would point out, however, that under current management programs the public fisheries resources are taken by the industry without charge or other form of return to the public sector. The Magnuson Act, which specifically authorizes the use of limited entry systems, does not provide the authority to the Secretary to assess the industry for the use of the public resource, whether it be under open access or limited entry management. As you know, the Act currently limits any fee charged only to the administrative costs of issuing permits.

Officials from NOAA and NMFS have been developing proposals for user fees which would, at least, partially cover the costs of management in ITQ and open access fisheries, and provide some measure of return to the public. We have discussed these proposals with a working group from Congress, industry, and the environmental community, and hope in the near future to forward a proposal regarding user fees to the Congress.

Question 2: In offshore oil exploration, the privilege to use the resources is awarded through an auction. Is this an appropriate method to distribute ITQs.

Answer: Auctions could be one of the alternatives considered by the Council in developing an ITQ program, if authorized by Congress. It has the advantage of allowing the marketplace to determine the initial allocation of shares, rather than being determined by Councils or Federal officials through the establishment of qualifying criteria. This option is not now available under the Magnuson Act, nor is any other such method that would allocate shares and also remunerate the tax payers for the privilege to fish for a public resource.

Question 3: Do you agree with Mark Lundsten's testimony that "there is no right to compensation to [quota] holders in the event the system is changed or revoked."

Answer: Yes. We believe, and have published statements as part of the rulemaking process, that ITQ shares are considered revokable harvesting privileges that can be withdrawn or changed as necessary to achieve the objectives of the management program. As such, the revocation of such shares and the ITQ program would not constitute a "takings" under the 5th Amendment. No compensation, therefore, would be required to share holders. We believe, however, that if ITQs stabilize fisheries, lead to stock rebuilding, and otherwise promote economic efficiency and job stability, there would be no need to revoke them.

MONOPOLIZATION

Question 1: Do ITQs promote "big business" as large companies have resources to buy or lease a significant amount of shares?

Answer: This could happen, as experienced with grocery stores, agriculture and other such enterprises. However, the Councils now have the ability to limit the shares that any one entity can hold. I would also point out that small quota holders, under current allocation programs would continue to have some control, i.e., they have the option of retaining their shares and do not have to sell to large companies.

ITQ programs tend to promote efficiency, regardless of the financial capability of a share holder. To the extent that larger firms are relatively better capitalized, they may be able to obtain more shares relative to their needs for efficient operation than could smaller firms. However, we have not experienced any developments, to date, to lead us to believe that inefficient, large firms have an advantage over efficient, small firms. Furthermore, large enterprises under existing open access fisheries already "control" the largest harvest shares. Initial allocations currently go to existing fishermen based largely on their historical catches. Thus, small enterprises, if they exist, are included and will be under ITQ programs.

Question 2: What, if anything, should be done to preserve small,

traditional fishing communities and prevent "big business" from controlling an ITQ fishery?

Answer: The degree to which small, traditional fishing communities are to be protected and supported under a management program is a matter for the Councils to determine in establishing the objectives of a management program. Stability of the existing fishery and the welfare of small vessels/communities must be contrasted with the objectives of achieving full economic efficiency, although one does not necessarily preclude the other. The decisions of the Council, however, ultimately must be consistent with the Magnuson Act's objective to manage for the greatest benefit to the nation.

Consideration of the needs of small communities can be taken into account through a Community Development Quota system (CDQ), such as used in Alaska for the pollock fishery, and which will be implemented for other species. Under a CDQ, a portion of the total quota (7.5% in Alaska) is allocated to and divided among several qualified communities. Each community's share is divided among the fishermen/vessels of the community in whatever way it desires. CDQs protect the communities with relatively small vessels that may be at a competitive disadvantage from larger operations.

It is possible, though not necessarily desirable, to place restrictions on the concentration and ownership of ITQ shares, restricting their ownership and use to certain sizes of businesses, locations of landings, or other constraints. We must be explicit about the costs in economic efficiency of such social engineering, but it is a legitimate exercise of public policy. Nevertheless, any combination of allocations and controls lie within the authorities given to the Councils.

Question 3: How might ITQs be structured so as not to contribute to increasing monopolization and concentration of ownership of fishing rights? How might the unacceptable concentration of ownership be determined for any fishery?

Answer: Councils can set limits on the amount of quota that can be held by any individual or entity. The surf clam and ocean quahog ITQ program relies on anti-trust regulations to prevent monopolies from developing. This process, however, would not be helpful except in the most extreme case, and would be a very lengthy process.

An example of ownership limits imposed by a fishery management plan (FMP) is found in the sablefish IFQ regulations, which state that "no vessel may be used, during any fishing year, to harvest more than 1 percent (0.01) of the combined fixed gear TAC of sablefish for the Gulf of Alaska and Bering Sea and Aleutian Islands IFQ regulatory areas, except that, in the IFQ regulatory

area east of 140 degrees west longitude, no vessel may be used to harvest more than 1 percent (0.01) of the fixed gear TAC of sablefish for this area."

The laws against unfair trade practices apply to the fishing industry, and remedies can be sought through the Justice Department if illegal activities, e.g., monopolistic control, appear to be occurring. Illegal practices of this nature have not been detected in the ITQ programs currently in operation.

ALLOCATION

Question 1: If Magnuson was amended to allow collection of revenues in excess of administration costs, would auction of quota shares be a preferred option? Under what circumstances should revenues from an ITQ program be used to finance a buyout option for compensating those who are forced to leave a fishery?

Answer: Auctions represent one of many options that the Councils could consider on a case-by-case basis if the authority were granted by Congress. Buyouts should not be considered since other Federal sources of small business and economic adjustment assistance exist.

TRANSFERABILITY

Question 1: Is free market transferability of quota shares necessary?

Answer: Generally yes, particularly in an overcapitalized fishery. Otherwise, even with a license limitation system, excess harvesting capacity will remain in a fishery, since there is little or no incentive to exit. In essence, the inability to sell quota shares will freeze the problem of excess harvesting capacity at existing levels and will perpetuate associated problems. Transferability allows the marketplace to determine who participates in the fishery and to what extent. In addition, transferability allows the consolidation of fishing effort into efficient operations that fully utilize harvesting capacity. Fishing by fewer vessels can often facilitate effective enforcement and fisheries management programs.

ENFORCEMENT

Question 1: What are the potential enforcement problems with individual quota systems? What is the enforcement experience where these have already been used?

Answer: ITQ programs can add incentive to underreport and/or misreport actual catches by individuals in the fishery. Theoretically, under an ITQ program, the nature of potential violations would shift from illegal harvesting to underreporting

and misreporting catches. Therefore, the emphasis of enforcement must shift from considerable work at sea to dockside detection efforts and/or electronic monitoring of catches and subsequent landings. Catches and purchases of fish by dealers/processors must be monitored on an individual basis to ascertain share utilization and compliance with all regulations. There may also be more incentive to high-grade fish, that is, to keep the most valuable fish to count against a quota, and to discard less valuable fish.

In theory, compliance by the industry should improve since the fishermen have a financial stake in seeing that the resource is protected and all participants operate within their quota. However, as New Zealand's experience demonstrates, self regulation is unlikely without a strong enforcement presence to assure compliance. When enforcement is effective enough to convince potential violators that they will be caught and prosecuted, compliance will reach satisfactory levels.

BYCATCH

Question 1: What impact do ITQs have on bycatch? What about "highgrading" under an ITQ regime? Is this a greater problem with ITQ systems than in an open access fishery?

Answer: Ideally, ITQs can reduce bycatch because fishermen are not in a race for the fish and can afford to fish more cleanly. In a multi-species fishery under an ITQ program, all bycatch should be under quota and accounted for. This assumes effective enforcement and compliance. In practice, there will likely be some highgrading under an ITQ program that will result in discarding of lesser valued fish. The only way to mitigate this practice would be through aggressive monitoring of fishing efforts, coupled with fines to make the practice unattractive.

CRITICISMS OF ITQS

Question 1: In recent U.S. experience, what have been the more common criticisms of proposed ITQ regimes? How have these criticisms been addressed?

Answer: The greatest concern is that an ITQ program represents a fundamental change in the method of managing the fisheries that would lead to the control of the fishery by large entities. There is also concern that after the initial distribution of shares, young or poorer fishermen will not be able to enter the fishery because of the high cost of shares. Other concerns include high-grading, lack of compliance that can undercut the program, high enforcement costs, and reduced employment and crew income.

Many of these criticisms expressed by fishermen are believed to

be valid concerns. ITQ programs are not without their problems, but they do represent an alternative that could resolve many of the most pressing problems such as extreme overcapitalization of the fleets that serves to prevent effective management of the fisheries. We have worked extensively with the industry and the Councils to describe ITQ programs, and discussed potential problems and solutions to them. In this effort, we commissioned a series of studies on ITQ programs to provide information and guidance to the Councils on the general principles of ITQs and to show how they might be applied to specific fisheries. Many of the concerns of industry can be dealt with and be alleviated through properly designed management programs. We have encouraged the Councils to work with industry to consider limitations on share ownership, the need for compliance, and other aspects of such programs.

ENFORCEMENT

Question 1: How do the data requirements for managing fisheries with ITQs compare with more traditional management regimes? How much does this contribute to cost savings or increased expense?

Answer: For ITQ programs to be successful, data collection requirements under an ITQ program would need to increase relative to traditional management regimes. Files on individual quota ownership must be maintained, and all transactions involving the sale or lease of quota must be recorded on a real-time basis. Furthermore, data on individual vessel trips and landings must be maintained along with data on purchases by dealers/processors to corroborate the vessel landings data.

Because the existing ITQ programs in the surf clam and ocean quahog fishery, and the wreckfish fishery are relatively small, we do not have sufficient experience with extensive fisheries to determine actual costs over a significant period of time. The costs of administering these existing programs is relatively small, because there are only about 60 vessels in the surf clam and ocean quahog fleet and about 20 vessels in the wreckfish fishery to track. Under ITQ programs, we anticipate that enforcement will be more effective than under more traditional management systems. This is because the times and places where potential violations may take place will be predetermined and easier to monitor. Instead of more or less random sampling of fishing activities, we will systematically examine every situation in which a violation might occur. This more extensive coverage of the fisheries will come about only through increased enforcement resources, which might be partially offset through appropriate fees.

LOST JOBS

Question 1: What has been the impact of ITQ systems on jobs and

harvesters income? What can be anticipated for other fisheries proposed for ITQ systems?

Answer: Data on jobs and income are unavailable. Nevertheless, it is likely that the number of jobs in the surf clam and ocean quahog fishery and the wreckfish fishery have declined, while per capita income has increased. Through the sale and consolidation of quota shares, a number of vessels in these fisheries have retired. In the surf clam and ocean quahog fishery, the total number of vessels operating declined from 131 in 1990 (the year before the program was implemented) to 63 vessels in 1993. The number of vessels in the wreckfish fishery fell from 52 that initially qualified for participation in the program to only 19 during the 1993-1994 season. Undoubtedly, the number of crew associated with the vessels that left the fishery also declined but probably not in direct proportion to the vessels because some vessels were only part-time participants in the fishery, and some crews also worked on more than one vessel. In other cases, vessels that retired were not fully active in the fishery but remained in the fishery in order to qualify for the initial distribution of shares. As other fisheries come under ITQ programs some jobs will also be lost in order to resolve the problems of waste of capital resources, overfishing, and lost economic value to the Nation, vessel owner and crew. It should be noted that many of these jobs would have been lost in any event because of declining stocks and harvests, the extremely high cost of operation in an overcapitalized fishery, and the retirement of marginal vessels because of an inability to compete in open access fisheries.

We would anticipate improving profits by those vessels that remain in the fishery after the implementation of an ITQ program. Increased efficiency through a reduction in unnecessary production costs and an increase in ex-vessel prices will result in improved income, profits, and stability in the industry. An example is the wreckfish fishery in which ex-vessel prices about doubled after the program was implemented -- rising from an average range of $.80 to $1.00 per pound during the 1991/1992 season to an average of $1.70 for the 1992/1993 season. This increase is believed to be the result of improved product quality and better availability throughout the year, i.e., product supply better matched to market demand.

POLICY

Question 1: What is the current NMFS policy towards ITQs and how does current policy differ from the previous administration?

Answer: NMFS policy towards ITQs is that they represent one of several available tools for use in the management and conservation of our Nation's fisheries. As I testified, ITQ management has many positive features, and we should support

their use for many fisheries, but they should not be viewed as a panacea for all fishery situations. Our position is consistent with the previous administration that supported limited access programs, where appropriate. I believe this is also consistent with previous and current views at OMB.

Question 2: The NOAA strategic plan (July 15, 1993) discusses ITQs extensively and some feel that NMFS promotes ITQs above all other management alternatives. Would you comment?

Answer: The Strategic Plan discusses overfishing and overcapitalization in the fisheries as the two most serious problems that must be dealt with. It suggests that assigning negotiable shares of total allowable catch or allowable fishing effort to individuals is one alternative to resolve these problems. This is consistent with our current position. Although NMFS will provide support and technical advice as necessary, it is the role of the Councils to determine if the use of limited access is appropriate and useful in a fishery, and to recommend its implementation to the Secretary.

FUNDING

Question 1: Does NMFS currently have adequate funds to support approved ITQ programs? (Atlantic surf clams, wreckfish and halibut/sablefish).

Answer: Our FY 1994 budget includes adequate funds for the ITQ programs that have been implemented to date.

Question 2: Does NMFS' 1995 budget request include adequate funds for current ITQ programs and ITQs that may be approved next year?

Answer: Yes, our FY 1995 budget request is adequate for currently approved programs. I would note, however, that our FY 1995 budget request includes an additional $1.2 million specifically for the halibut/sablefish IFQ program in Alaska.

Question 3: Does NMFS currently have the capability to manage the amount of data involved in the ITQs already approved? (transfers, sales, leases, etc.)

Answer: As stated earlier, the FY 1995 budget request is adequate for the current ITQ/IFQ programs already approved by the Secretary. We have been able to manage the relatively small surf clam/ocean quahog and wreckfish programs without problems, and the additional $1.2 million specifically requested for the halibut/sablefish IFQ program in Alaska will permit the development of data programs to cover those fisheries as well.

Question 4: Should holders of ITQs be required to pay the

additional cost of an ITQ program? If so, what amendments to the Magnuson Act are needed to require ITQ participants to pay these additional costs?

Answer: We believe that the extra costs of ITQ programs should, at least to some extent, be borne by the individuals that benefit from the ITQ. To this end, officials from NOAA and NMFS have been developing proposals for user fees which would partially cover these costs. We have discussed these proposals with a working group from Congress, industry, and the environmental community, and expect to forward a proposal regarding user fees, including necessary amendments to the Magnuson Act, to the Congress shortly.

ENFORCEMENT

Question 1: Does NMFS currently have adequate enforcement personnel for approved ITQ programs?

Answer: Currently, our funds and staff are adequate to enforce existing ITQ programs. In addition, our FY 1995 budget request calls for an increase of **$4.6 million** for our enforcement efforts overall for both new ITQ programs that are expected to come on line in Alaska in FY 95 and traditional enforcement efforts. The Alaska ITQ program will need $2.1 million ($1.2 million for ITQ management and $0.9 million for enforcement) in FY 95 in addition to the $400,000 currently being expended during FY 94 in preparation for that program.

PROPERTY RIGHTS

Question 1: It is said ITQs do <u>not</u> grant "property rights" but merely "harvest or access rights", if a person pays fair consideration for the transfer of a quota would it not be unfair for the Government to then "change the rules" by imposing another management regime that may not protect the purchaser of the ITQ?

Answer: ITQs can be viewed as transferring harvest privileges rather than actual property rights. These harvest privileges can be withdrawn at anytime depending on how the ITQ program is designed. However, withdrawal of these rights in a practical sense may be problematic once they are granted to individuals or companies. If ITQ management is totally successful, economically efficient, and leads to stock rebuilding and stability in a fishery, we can foresee no reason to withdraw the privilege and impose an alternative regime.

Present ITQ plans, and regulations implementing the plans, put the public on notice that the quota shares are considered revocable harvesting privileges and not a property right for purposes of a "taking" under the Fifth Amendment to the Constitution. Therefore, those purchasing ITQ shares or granting

loans on such shares must realize the risk and act accordingly, similar to many other like investments.

Question 2: Can NMFS adequately monitor the transfer of ITQ shares. (can NMFS actually determine who owns what for the purpose of determining ownership of excess shares, enforcement, reallocation, etc.?)

Answer: Yes. Specific guidance and strictly controlled transfers and reporting should allow effective monitoring programs to prevail. Ultimately, electronic monitoring will be essential to effective management of ITQs. Excessive shares have not been defined; however, a definition could be developed by each Council, if appropriate.

The institutional infrastructure for recording ownership and facilitating private markets in ITQs needs attention, including funding requirements, and will be considered in developing and implementing new ITQ programs. We view the infrastructure as resembling a microcosm of the Securities and Exchange Commission for monitoring transactions for stock and bond shares.

MONOPOLIZATION

Question 1: What does NMFS consider an "excessive" amount of quota for one entity to possess?

Answer: NMFS has no policy on this issue, although individual plans may specify limits. The Councils will have to consider this on a case-by-case basis. In the absence of plan limits, NMFS is guided by Justice Department guidelines on industry ownership patterns and performance that would violate antitrust statutes.

COSTS

Question 1: What has been the U.S. experience of the cost of implementing ITQ programs? What aspects of these programs add to or reduce a management costs compared to traditional management regimes?

Answer: NMFS' current capabilities are adequate to monitor existing ITQ programs. It is difficult; however, to precisely identify the costs of ITQ programs because many of the resources, both capital and human, utilized to implement an ITQ program are also used for activities related to other FMPs or fisheries programs. Nevertheless, it has been estimated that implementation costs of the surf clam and ocean quahog program were about $120,000 and $70,000 is required to manage the program annually. These figures represent expenditures for monitoring and tracking of share ownership and landings, but do not include enforcement costs. Estimates for the wreckfish fishery in the

South Atlantic total about $75,000 annually, and the cost of a fully implemented IFQ program in the Alaska Sablefish and Halibut fisheries are projected at approximately $3.1 million per year. Funding included in the FY 1995 President's Budget totaling $1.6 million is sufficient for the Halibut and Shellfish IFQ program in 1995. Development of ownership documentation, trading and other management processes, appeal board activities, data systems, and computer programs are considered one-time start-up costs of implementation, while there will continue to be costs of administration, share calculation and notification/documentation, tracking and monitoring of quota shares ownership and enforcement on an annual basis.

The difference between costs under traditional and ITQ management primarily results from the requirement to monitor fleet activity as a whole versus the activities of individual fishermen.

Under a fleet-wide quota management program, the government can sample fleet wide landings, extrapolate to the whole fishery, and close the fishery when the total quota is projected to be met. Open access programs can be more complex, requiring the use of specialized gear, and imposing specific limits on fishing times or methods. At-sea or specialized enforcement activities are required to ensure compliance and effectiveness of the program.

Under an ITQ program, the government cannot assume that the activities of one fisherman are parallel to those of another. Therefore, programs must be established to monitor the share ownership of each individual, including sales and purchases, and the utilization of that share throughout the year. Management programs can be less complex, allowing fishermen to use the most efficient gear and fishing techniques. Relatively expensive at-sea enforcement is expected to be considerably less, however, being replaced by less costly dockside and reporting-based enforcement. However, should high-grading of catches become significant, at-sea enforcement under an ITQ program would continue to be required and costs would increase correspondingly.

Question 2: Many ITQ systems operate by allocating percentage shares of the allowable harvest. What other variations or modifications of this approach are possible, and which might be their comparative benefits/liabilities?

Answer: There can be many other alternatives to allocating shares limited only by the imagination of the Council developing the program. In New Zealand, shares were allocated in pounds of fish, but this was found to be inoperable and was revised to a percentage share basis. The particular drawback to poundage shares occurs when the total allowable quota is decreased and fishermen must surrender a certain number of pounds. At a minimum, this can be a very contentious process, and, in the case of New Zealand, was not effective because the government was

required to buy back the necessary shares from the fishermen. Another example is in the spiny lobster fishery managed by the state of Florida. The quota system is based on traps allowed to be utilized and are transferable just as in a percentage-harvest-share system. This program is still being implemented and no information on the success or problems with the system are available. We are not aware, however, of major problems developing in this fishery.

CONSERVATION

Question 1: Has any consideration been given to charging for ITQs in relation to the estimated environmental stress associated with the fishery or harvester practices?

Answer: Charging based on environmental stress has not been discussed in any detail because the Secretary is currently prohibited from assessing fees in excess of the cost of issuing permits. An alternative amendment to the Magnuson Act that provides for the assessment of fees based on the value of ITQ shares has been discussed with a working group from Congress, the Administration, industry, and the environmental community charged with considering alternative resource fees.

GENERAL

Question 1: Dave Wallace complains about allocation sanctions, how do you respond to these complaints?

Answer: The inclusion of allocation sanctions in the penalty schedule for violations of the surf clam and ocean quahog regulations is designed to deter violations of the measure that is at the very core of the Individual Transferable Quota system. Only those regulations assuring that ITQs and, in turn, the annual quota, are not unlawfully exceeded involve allocation sanctions if violated. In the experience of the enforcement arm of the NMFS, and based on at least one independent study, civil monetary penalties in most instances are an insufficient deterrent to fishing violations. This is due to the relative low probability of detecting a fishing violation. This enables those fishing in violation of the regulations to recoup the amount of any penalty paid by continuing to fish illegally. In these cases, a civil monetary penalty is reduced to simply a cost of doing business. Studies have shown that only when a civil penalty of several hundred thousand dollars is assessed does a civil penalty begin to represent a deterrent to further violations.

The agency's first experience with domestic permit sanctions was in the Northeast Region. Vessel permit sanctions in addition to civil penalties, and in some cases catch seizures imposed for closed area violations, had a dramatic effect on maintaining the

integrity of the boundaries of the closed areas. In the surf clam and ocean quahog fishery, the transferability of allocations render vessel permit sanctions relatively useless. An allocation holder does not have to own a vessel to harvest the allocation. Allocation holders can contract with other vessel owners to harvest these allocations. An allocation holder who does not own a vessel is immune from a vessel permit sanction. Thus, an allocation sanction is the only logical deterrent. However, due to the gravity of such a sanction, it is reserved only for those violations that go to the very core of the allocation system.

Question 2: Dave Wallace also talks about turning over the Federal quahog fishery off Maine to the state. What is going on?

Answer: Soon after implementation of Amendment 8 to the Fishery Management Plan for the Atlantic Surf Clam and Ocean Quahog Fishery, a vessel registered in the State of Maine was discovered by the Coast Guard to be fishing for mahogany quahogs in the exclusive economic zone off the coast of Maine without a valid Federal fisheries permit for the quahog fishery. The case was forwarded by the Coast Guard to the NMFS for disposition. Looking beyond the facts of this case, the NMFS discovered that the majority of participants in the Maine mahogany quahog fishery, which until 1987 was prosecuted exclusively in State of Maine waters, believed they were fishing for a species of quahog other than the one subject to Federal management and fished primarily off the mid-Atlantic states. The mahogany quahog, although quite different in size and color from the typical ocean quahog harvested in the Mid-Atlantic, is, however, of the same species, *Arctica islandica*.

Technically, the participants of the Maine mahogany quahog fishery are subject to the regulations that implement Amendment 8. However, operating under the mistaken belief that they were harvesting a species of quahog not subject to Federal management, the participants in this fishery never obtained a Federal fisheries permit or filed logbooks. Since they had never filed logbooks reporting their catch of quahogs, none of the participants qualified for an allocation of quahogs. An allocation of quahogs was based on the annual average of reported quahogs landings for a given number of years.

Due to the general lack of data concerning the Maine mahogany quahog fishery, the Regional Director, in consultation with the Mid-Atlantic Fishery Management Council (Council) and the New England Fishery Management Council, decided to implement an experimental fishery in the small area where the fishery has historically been prosecuted. The experimental fishery is continuing at this time.

A survey of the Gulf of Maine stock was done in the summer of 1992. However, due to time and resource constraints, the survey

was conducted only in previously fished areas making it non-random and of little use in determining available stock size and other characteristics.

At its June, 1992 meeting, the Mid-Atlantic Fishery Management Council voted to allow the Regional Director to resolve the problem through preparation of a Secretarial Amendment to Amendment 8. A draft Amendment 9 was subsequently prepared by the Regional Director and presented at two public hearings, in Machias, Maine and Cape May Courthouse, New Jersey. The draft amendment was then taken to the Council for its recommendation. The Council recommended that the Regional Director cease processing Amendment 9 and return responsibility for managing the Maine mahogany quahog fishery to the Council, which the Regional Director did.

The Magnuson Act requires that a fishery should be managed, to the extent practicable, throughout its range. National standard 3 provides, in part, that "to the extent practicable, an individual stock of fish shall be managed as a unit throughout its range ..." The national standard guidelines at 50 C.F.R. Part 602, however, provide that management measures need not be identical for each geographic area in the management unit if the fishery management plan justifies the differences. The Maine mahogany quahog fishery is markedly different from the quahog fishery off the remainder of the east coast. Therefore, the Council can explore management measures different from those in Amendment 8, the amendment that established the individual transferable quota (ITQ) system, to manage the Maine mahogany quahog fishery. If the Council develops a different management scheme for the Maine mahogany quahog fishery that is justified in its Amendment to the FMP, such an approach would not be inconsistent with national standard 3. While the Council is in the process of developing a management scheme for this fishery, it is being operated as an experimental fishery. Participants in the experimental fishery are now subject to permitting and reporting requirements. One of the conditions of the experimental fishing permit is that the fishery be conducted only in the area north of 43°50′ N. latitude. The Council may elect to manage this discrete fishery through an ITQ or other management system, or may recommend transfer of management responsibility to the New England Council if it represents a discrete stock of quahogs.

Question 3: Wally Gordon will testify that an ITQ share of the surf Clam industry could sell for $2.5 million. Is this estimate correct? Assuming that we are talking about this level of cost, would it not be inequitable for Congress or Commerce to change the rules to deprive the holder of a commodity with this value?

Answer: Information available in "The Performance of US Atlantic Surf Clam and Ocean Quahog Fisheries under Limited Entry and

Individual Transferable Quota Systems" by Stanley D. Wang and Vuong H. Tang, Fishery Analysis Division, NER, NMFS, Gloucester, May 1993, provides an insight to the value of ITQ shares in the surf clam fishery. On p. 10, they state: "Based on a NMFS interview in February, 1992, the surf clam ITQs were traded for about $20.00 per bushel and leased for about $4.00 per bushel annually (Ross 1992). Accordingly, the U.S. surf clam resource with a quota of $2.85 million bushels was evaluated at about $57 million in property values and generated approximately $11.4 million in resource rents in 1992."

Because NOAA does not record price in the documentation of share transfers, there is no ready source of information on current share values in the fishery. However, based on the 1992 values reported by Wang and Tang, $2.5 million would have purchased 125,000 bushels worth of surf clam ITQ. Because NOAA has tried to make it very clear that ITQ shares represent revokable harvest privileges, we would expect that the value of shares incorporates the market's evaluation of the risk that the ITQ value will be abrogated, and a change in the rules, therefore, is as "fair" as any other risky venture. In general, the greater the risk of change in the rules, the lower the market value of the ITQ share, and the fewer the benefits associated with the ITQ program. We have no basis to recommend legislation to limit ownership based on the value of a share of quota.

II. QUESTIONS FROM REPRESENTATIVE HUGHES:

A. QUESTIONS ON AMENDMENT NINE TO THE SURF CLAM AND OCEAN QUAHOG MANAGEMENT PLAN:

Question 1: According to my understanding of the Magnuson Act, NMFS should be managing the quahog fishery throughout its range. Why should the quahog fishery in Federal waters off the coast of Maine be managed apart from the rest of the east coast quahog fishery?

Answer: The National Marine Fisheries Service (NMFS) has prepared a draft Secretarial Amendment, Amendment 9 to the Fishery Management Plan for the Atlantic Surf Clam and Ocean Quahog Fishery (FMP), to manage the Maine mahogany quahog fishery. Work on this document, however, has ceased. The Mid-Atlantic Fishery Management Council (Council), which originally recommended that NMFS undertake preparation of Amendment 9, voted to recommend that management responsibility for this fishery be returned to the Council, and NMFS has agreed to this recommendation.

Your understanding of the Magnuson Act is correct. A fishery should be managed throughout its range. National standard 3 provides, in part, that " to the extent practicable, an individual stock of fish shall be managed as a unit throughout its range ..." The national standard guidelines at 50 C.F.R. Part 602, however, provide that management measures need not be identical for each geographic area in the management unit if the fishery management plan justifies the differences. The Maine mahogany quahog fishery is markedly different than the quahog fishery off the remainder of the east coast. Therefore, the Council can explore different measures for the Maine mahogany quahog fishery than those in Amendment 8, that established the individual transferable quota (ITQ) system. If the Council develops a different management scheme for the Maine mahogany quahog fishery that is justified in its Amendment to the FMP, such an approach would not be inconsistent with national standard 3. While the Council is in the process of developing a management scheme for this fishery, it is being operated as an experimental fishery. Participants in the experimental fishery are subject to permitting and reporting requirements. One of the conditions of the experimental fishing permit is that the fishery be conducted only in the area north of 43°50′ N. latitude.

Question 2: Has NMFS considered the effect that establishing an exception to Amendment Eight -- through the promulgation of Amendment Nine-- might have on the ITQ system? If so, what were NMFS' conclusions and why? If not, why not?

Answer: As I noted in my response to your first question, NMFS is no longer processing Amendment 9. NMFS expects that the

Council will complete an exhaustive analysis of the impacts of any management scheme(s) developed for the Maine mahogany quahog fishery that may deviate from the management measures in Amendment 8.

Question 3: Is there a separate quota for the Maine fishery? If there is, has there been any population study? What percent of the biomass is to be taken each year?

Answer: The Council has yet to develop a set of alternative management measures to manage the Maine mahogany quahog fishery. Consequently, there is no quota imposed on this fishery at this point in time. Though a separate quota for this area is a possible management measure, it is difficult to speculate whether there would be sufficient biological studies conducted to support it. Even if there were adequate biological justification for a separate quota for the Maine mahogany quahog fishery, such a measure may not be adopted as part of the Council's preferred management alternative.

Question 4: Does Amendment Nine, in effect, restrict the non-maine resident from fishing in the state by creating a landing law and gear restrictions which are unique to Maine?

Answer: Since the Council has yet to develop its own amendment to manage the Maine mahogany quahog fishery, such a restriction is not in effect. Whatever measures the Council adopts in its amendment to manage this fishery, the amendment cannot directly regulate fishing in state waters without the Secretary of Commerce formally preempting the State of Maine's regulation of this fishery under the provisions of section 306 of the Magnuson Act.

Question 5: Were Maine vessels illegally fishing in the EEZ before Amendment 8 went into effect? If so, is that why they were not issued quahog allocation? Had the Maine fishermen ever reported their quahog catch in the EEZ on the required logbooks?

Answer: It is NMFS' understanding that the Maine mahogany quahog fishery moved into the exclusive economic zone (EEZ) in 1987 only after extensive closures in State of Maine waters due to the presence of the organism that causes paralytic shellfish poisoning. None of the vessels in this fishery, to the best of NMFS' knowledge, had a Federal fisheries permit to fish for quahogs in the EEZ. Thus, if these vessels were fishing in the EEZ, they were fishing illegally.

Shortly after the implementation of Amendment 8 to the FMP, a vessel registered in the State of Maine was discovered by the Coast Guard fishing for mahogany quahogs in the EEZ off the coast of Maine without a valid Federal fisheries permit for the quahog fishery. The case was forwarded by the Coast Guard to the NMFS

for disposition. Looking beyond the facts of this case, the NMFS discovered that the participants in the Maine mahogany fishery believed they were fishing for a species of quahog that was not subject to Federal management. The mahogany quahog, although quite different in size and color from the typical ocean quahog harvested in the Mid-Atlantic, is of the same species, Arctica Islandica.

Operating under the mistaken belief that they were harvesting a species of quahog not subject to Federal management, the participants in this fishery did not obtain Federal fisheries permits or file logbooks. Since they never had filed any logbooks reporting their catch of quahogs, none of the participants qualified for an allocation of quahogs when Amendment 8 to the FMP was implemented. Allocations of quahogs were based on the annual average of reported quahogs landings.

Question 6: What steps has NMFS taken to work with the rest of the quahog industry to resolve the issues surrounding the Maine fishery? The quahog industry maintains that it forwarded a proposal that would have provided for the entry of the Maine fishery into the general east coast fishery: what action did NMFS take with regard to this proposal and why?

Answer: During the preparation of the Secretarial Amendment, Amendment 9, NMFS involved the Council and the industry in the development of the management regime for the Maine mahogany quahog fishery. At one point, NMFS brought representatives of the Maine mahogany quahog fishery and the Mid-Atlantic quahog fishery together to discuss a possible resolution to management problems posed by the Maine mahogany quahog fishery.

The Mid-Atlantic quahog industry, or at least a certain part of that industry, did forward a proposal to bring the Maine mahogany quahog fishery into the general east coast quahog fishery. Since the Council has again assumed management responsibility for the Maine mahogany quahog fishery, that proposal is before the Council for its consideration during the development of the various management alternatives for this fishery.

B. QUESTIONS ON THE INCLUSION OF ALLOCATION SANCTIONS IN THE PENALTY SCHEDULE UNDER THE SURF CLAM AND OCEAN QUAHOG MANAGEMENT PLAN:

Question 1: Why did NMFS decide to include allocation sanctions in the penalty schedule under the surf clam and ocean quahog management plan?

Answer: The inclusion of allocation sanctions in the penalty schedule for violations of the surf clam and ocean quahog regulations is to deter violations of the measure that is the very core of the individual transferable quota system (ITQ).

Only those regulations assuring that ITQs and, in turn, the annual quota, are not unlawfully exceeded involve allocation sanctions if violated. In the experience of the enforcement arm of the NMFS and based on at least one independent study, civil monetary penalties in most instances are an insufficient deterrent to fishing violations. This is due to the relatively low probability of detecting a fishing violation. This enables those fishing in violation of the regulations to recoup the amount of any penalty paid by continuing to fish illegally. In these cases, a civil monetary penalty is reduced to a cost of doing business. Studies have shown that only when a civil penalty of several hundred thousand dollars is assessed does a civil penalty begin to become an effective deterrent to further violations.

The agency's first experience with domestic permit sanctions was in the Northeast Region. Vessel permit sanctions in addition to civil penalties, and, in some cases, catch seizures imposed for closed area violations had a dramatic effect on maintaining the integrity of the boundaries of the closed areas. In the surf clam and ocean quahog fishery, the transferability of allocation render vessel permit sanctions relatively useless. An allocation holder does not have to own a vessel to harvest the allocation. Allocation holders can contract with other vessel owners to harvest their allocations. An allocation holder who does not own a vessel is immune from a vessel permit sanction. Thus, an allocation sanction is the only logical deterrent. Due to the gravity of such a sanction, however, it is reserved only for those violations that go to the very core of the allocation system.

Question 2: Has NMFS studied the effect of possible sanctions on the lending industry's willingness to loan money for the purchase of ITQ's? If not, why not?

Answer: NMFS has not conducted such a study, and does not have the financial expertise to conduct a study of this nature. NMFS did, however, place a draft penalty schedule before the industry for their comment, including comments by representatives of the lending institutions. The issue of greater concern to the lending institutions was their liability as owners of record of allocations, titles to which are taken as security for loans. Before the penalty schedule, including the proposed allocation sanctions, had been distributed to the industry for comment, certain lending institutions had inquired about their liability for a civil penalty as owners of record of allocations. They were advised that they could be vicariously liable for a civil penalty in certain circumstances. This apparently did not deter National Westminster Bank from becoming one of the largest allocation holders in the industry as the result of allocation being transferred to it as security for a loan.

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One of NMFS' obligations under the Magnuson Act is to implement fishery management plans. In concert with this obligation, it is incumbent on NMFS to make the regulations as effective as possible. This entails the imposition of penalties appropriate to deter violations of the regulations that would unravel the fabric of the management regime concerned. NMFS believes that allocation sanctions are essential to deterring violations of the core regulations of the ITQ system. NMFS is primarily concerned about assuring the continued operation of the ITQ system, in which certain lending institutions have already heavily invested, rather than the banks' willingness to lend money to purchase ITQ.

Question 3: Many participants in the quahog fishery are concerned about the effect of allocation sanctions on the availability of loans to purchase ITQ. What steps is NMFS taking to ensure access to credit and maintain the stability of the ITQ market?

Answer: NMFS' primary obligation is to ensure the continued integrity of the ITQ system. Core violations of the regulations that result in an allocation holder harvesting in excess of his/her allocation has a negative effect on the resource and is patently unfair to the other allocation holders. It is essential that these violations be dealt with appropriately to assure the confidence of the other allocation holders in the overall management of the ITQ system. These concerns are not outweighed by concerns about continued access to credit. To date, there have been no violations of the regulations as they pertain to the quahog fishery that would warrant the imposition of a sanction to an allocation permit. In the surf clam fishery, only one allocation holder has committed a violation that would have resulted in a sanctioning of the allocation permit had the current penalty schedule been in effect at the time of the violation. Given the rare occurrence of violations to date, the concern about the availability of loans to purchase ITQs may be unwarranted.

The private sector should dictate what steps it will take to make sure that allocation sanctions do not frustrate the loaning of monies to purchase ITQs. The structure of the penalty schedule is such that no one can lose an allocation permanently for any first time violation of the regulations. A first time violation of a regulation for which an allocation permit sanction is warranted results in a loss of 50 percent of the allocation for a year. It is not until the third successive violation of certain regulations that allocation is lost permanently. In light of this, any lending agreement to purchase ITQ could include provisions to protect the bank should a allocation permit sanction be imposed.

Question 4: Many participants in the fishery also contend that under the revised penalty schedule, owners of ITQ's could lose

their allocations through the actions of a contractor or subcontractor. Is this true? If true, how can owners of ITQs protect themselves from such problems?

Answer: This contention is true. It stems from the legally accepted principle of vicarious liability. In the early stages of regulation under the Magnuson Act, vessel owners initially sought to insulate themselves from liability for any violation of the regulations involving their vessel. The owners argued that the vessel operator was an independent contractor and beyond their control. The law views both the owner and the operator of a vessel as being individually and jointly responsible for a violation committed using the owners vessel. Vicarious liability also applies to the relationship that exists between an allocation holder and a contractor or subcontractor hired to harvest the allocation, but not in an automatic fashion. To take the position that an allocation holder's permit is beyond sanction for any violation committed by a contractor or subcontractor who harvests the allocations opens up an avenue to compromise the integrity of the ITQ system. Unscrupulous allocation holders could subvert the entire system by having contractors land amounts of product in excess of their allocation. Depending on how widespread this practice became, the ITQ system could unravel. This would cause economic chaos in the industry.

As noted in the answer to question 1, the number of regulations, the violation of which will result in a sanction to an allocation permit, are few. They are: (1) landing surf clams or ocean quahogs in excess of an allocation; (2) manufacturing, altering, duplicating, or stealing a cage tag; (3) tagging a cage with a used or void tag; and (4) submitting with intent false information in required reports. All of these violations involve an active intent to increase the share that an allocation holder is authorized to remove from the fishery. None of these violations can be committed accidentally except in some rather exceptional circumstances. Because such circumstances do exist, the agency will exercise its prosecutorial discretion on a case by case basis in determining whether an allocation sanction is warranted based on a violation involving a contractor or subcontractor harvesting an allocation. Given the few violations of the regulations for which an allocation sanction attaches, the active intent involved in committing these violations, and the limited set of circumstances in which an allocation sanction will be imposed based on a violation by a contractor or subcontractor harvesting the allocation, the industry should not feel at great risk.

Allocation holders can protect themselves from an allocation permit sanction imposed as the result of a violation committed by a contractor or subcontractor harvesting the allocation by contracting with reputable individuals. As noted above, a

violation of the regulation for which an allocation permit sanction is warranted involves a malintent on the part of the violator except in unusual circumstances. In addition, contracts for the harvest of an allocation can provide for reimbursement by the harvester for any liability imposed on the owner of an allocation for any violation committed by the harvester.

Question 5: How did NMFS come to the conclusion that allocation permit sanctions were a more effective penalty than increased fines?

Answer: Studies have shown that due to the low probability of detecting a fishing violation and the income that is generated from fishing in violation of the regulations, a civil penalty of several hundred thousand dollars would have to be assessed against an individual involved in a fishing violation to have a deterrent effect. This is well above the maximum level of civil penalty for a single violation of the Magnuson Act. Consequently, for many operators assessed civil penalties under the Magnuson Act, the payment of a penalty becomes a cost of doing business. Also, the Magnuson Act requires that a range of factors, including a respondent's ability to pay, be considered when assessing a civil penalty.

The imposition of vessel permit sanctions initially represented a response to the rate of recidivism by fishermen in the groundfish fishery in the Northeast Region. Increased civil penalties and catch seizures had failed to deter vessel operators from fishing in closed areas. The imposition of the first vessel permit sanction had a dramatic effect on the fleet. Very few vessel operators were willing to take the risk of being discovered fishing in a closed area for fear of being subjected to a vessel permit sanction in addition to a civil penalty and a possible catch seizure. The structure of the ITQ system is such that an allocation holder does not have to own a vessel to harvest the allocation. The allocation holder may contract with another vessel owner to harvest part or all of the allocation. In fact, such arrangements are commonplace in the industry today. Recognizing that an allocation holder without a vessel is immune from a vessel permit sanction, logic dictates that sanctioning the allocation holder's allocation permit is the only reasonable approach to effect a deterrent to violating the core regulations of the ITQ system. To allow allocation holders to insulate themselves from an allocation permit sanction flies in the face of the recognition that civil penalties assessed under the Magnuson Act are simply not an effective deterrent to fishing violations.

Subcommittee on Fisheries Management
Questions from ITQ Hearing for Mark Lundsten
February 9, 1994

ALL WITNESSES RE: QUOTA ALLOCATIONS

1 - How do you believe quotas should be allocated and further how do we address the concern that current ITQ allocations amount to a federal give-away?

Quotas should be allocated according to historical participation in and reliance upon a fishery. Those who pioneered and sustained a fishery should be recognized as proven stewards of that fishery. Overall, this method should provide for the least disruption of any fisheries' socioeconomic structure.

The granting of marketable harvest rights, which is the way ITQ allocations must be made, I believe, is a responsible way for the government to handle a natural resource such as fish. Right now, fish is "given away" to anyone who wants to go out on the ocean and take it. With an expanding population on a finite, annually renewable resource, such open access eventually becomes both impossible to manage and dangerous to the resource. Granting ITQs to the historical participants not only saves the nation from the wreckage of financial chaos in the fleet by providing economic stabilization; it also provides a management framework that allows the fishermen who want to continue in the fishery to buy-out those who do not wish to continue.

To a few, ITQs will mean continuing to do business without having to buy more quota -- it will be a "give-away" to those proven pioneers in their fishery who have a record of high production. To most, ITQs will be a lever to continue fishing by committing themselves to further investment. To others, it will be a "severance check" paid for leaving an overcrowded business, a check written by other members of the business, not by any government agency. ITQ allocations may be viewed as a "federal give-away," but only by someone with no sense of how they work.

The creation and distribution of ITQ harvest rights is exactly what enables the industry to have its own buy-back program <u>at no cost to the government</u>.

2 - In offshore oil exploration, the privilege to use the resources is awarded through an auction. Is this an appropriate method to distribute ITQs?

An auction is probably the most fair system possible <u>if</u> there were no such thing as history. If, many years ago, we all came upon unfished oceans and <u>then</u> began auctioning the rights to fish, it might be viable now as a way of managing fish. Unfortuneately, history has established a series of reliances and traditions, social and economic, on personal and community levels that an auction would turn upside down. It would be a <u>disastrous</u> way to distribute IFQs.

3 - Do you agree with Mark Lundsten's testimony that "there is no right to compensation to [quota] holders in the event the system is changed or revoked?"

Having given the testimony in the first place, let me say I still agree with

it. A harvest privilege is not a property right. Though granted in perpetuity, it is only perpetual as long as the government chooses to keep that system of harvesting in operation. Should the government determine that system not to be viable,those privileges would be terminated. To explicitly establish that condition during the formation of an IFQ plan is essential to a manageable and terminable system.

ALL WITNESSES RE: MONOPOLIZATION

4 - Do ITQs promote "big business" as large companies have resources to buy or lease a significant amount of shares?

ITQs promote "big business" by allowing large companies with capital to buy or lease a significant amount of shares only insofar as transferability is not restricted by any given system. In the halibut and sablefish plan for the North Pacific that opportunity for big business is minimized or made nil by two conditions: one, the owner of the purchased quota must be on board the vessel harvesting that fish,and; two, only 1/2% of the fleetwide quota shares for halibut, and 1% of the fleetwide quota shares for sablefish may be owned by any single person. The "family farm" nature of these fisheries is thus protected from "big business."

On the other hand, for a fishery like pollock, the intense capitaliztion that only "big business" can provide is exactly what the fishery requires to compete in the world market for surimi. As with the manufacture of automobiles, nothing but "big business" can even operate, let alone compete, in such an environment. In that case, ITQs are a natural solution to our overcrowded, inefficient open-access system. They will promote the efficiency of American fishing companies, "big business" companies, by providing a market-driven harvesting-rights plan that rewards, by its very design, the most efficient of those companies.

5 -What, if anything, should be done to preserve small, traditional fishing communities and prevent "big business" from controlling an ITQ fishery?

The restrictions mentioned in answer to #4 for the halibut and sablefish plan comprise one solution to protect the communities involved in traditional, small-boat, community-oriented fisheries. Further, a requirement that fish caught in the halibut and sablefish ITQ system be brought to shore plants for processing assures that the communities role in handling product will be perpetuated.

The restriction of ITQs to owner/operators in the halibut-sablefish plan is not sensible for the other groundfish fisheries or crab in the North Pacific where non-owner skippers have long been the rule. But a cap on a percentage of the fleet quota that any entity can own, as well as a requirement for a percentage of the quota to be processed on shore are both ideas that would protect the traditions and economies of the fishing communities.

6 - How might ITQs be structured so as not to contribute to increasing monopolization and concentration of ownership of fishing rights? How might the unacceptable concentration of ownership be determined for any other fishery?

Restricting the percentage of quota that any entity can own or control is

the most direct way to insure that no one will monopolize any given fishery. The halibut-sablefish plan derived its limit on percentage of quota simply by assessing through reliable industry sources what the high-production segment of the fleet had averaged. The 1/2% and 1% limits for halibut and sablefish, respectively, are reflections of those averages. Any person averaging more than that percentage for the original allocation is allowed to fish that excessive quota above the limit but may not buy any more quota. A similar plan could be devised for any particular species.

7 - If Magnuson was amended to allow collection of revenues in excess of administration costs, would auction of quota shares be a preferred option? Under what circumstances should revenues from an ITQ program be used to finance a buyout option for compensating those who are forced to leave a fishery?

As stated in response to #2 above, "An auction is probably the most fair system possible if there were no such thing as history. If, many years ago, we all came upon unfished oceans and then began auctioning the rights to fish, it might be viable now as a way of managing fish. Unfortuneately, history has established a series of reliances and traditions, social and economic, on personal and community levels that an auction would turn upside down. It would be a disastrous way to distribute IFQs."

An ITQ program should obviate any need for a buyout option for compensation to those "forced to leave a fishery." As explained in #1 above, an ITQ system in itself should be an automatic, industry-funded buy-back program with no federal funds required for such an enormous undertaking.

ALL WITNESSES RE: TRANSFERABILITY

8 - Is free market transferability of quota shares necessary?

Free market transferability of quota shares is essential to the proper functioning of IFQs as a rationalizing tool for fisheries management. If quota shares are not transferable, a marginal operation with a marginal share of quota may not sell them or buy any more. That marginal operator will fish as long as possible before relinquishing that privilege to fish. The problem of too many boats chasing too few fish is not solved nor is that person allowed to increase his stake in that fishery.

If, on the other hand, quotas are transferable, a marginal operation has opportunity either to commit itself to further investment and buy enough quota to fish viably or to relinquish its operation for cash by selling its quota. Each fishery is allowed to find its own reasonable number of participants according to market forces within that fishery.

For IFQs to address the problem of overcapitaliztion, quota shares must be transferable.

ALL WITNESSES RE: ENFORCEMENT

9 - What are the potential enforcement problems with individual quota systems? What is the enforcement experience where

these have already been used?

The main enforcement problem I see with ITQs is the chance of unreported deliveries, or "quota-busting," resulting in an overfished stock of fish. A system of required reporting of each and every departure and arrival of ITQ vessels in any port and of required observers of each unloading with sufficient advance notice of that unloading is necessary to prevent this problem. That system is currently in place in British Columbia in their halibut quota-share program and is working well. In fact, the violations they have had have been solved by industry reporting. Since the fishermen have something to lose personally from anyone "laundering" fish secretly, they are the ones who have reported the few violations that have occurred.

ALL WITNESSES RE: BYATCH

10 - What impact do ITQs have on bycatch?

Bycatch can decrease under IFQs for a few reasons. The first is the simplest - with no derby or "race for fish," the operators of vessels wil have time and space to optimize their catch. We won't have to go for broke on every set as we do now in the North Pacific with our derby situation. Rather, we can set more carefully in "cleaner" fishing areas without worrying about how much time we have left. The incentive will be to maximize return on the poundage of quota allowed, not to maximize catch in the amount of time allowed.

Second, as long as there is a cap on the total amount of bycatch overall to any fleet for any species (for example, as long as only so many tons of halibut, a prohibited species for trawlers in the North Pacific, are available for that fleet each year), and each vessel has only so much "bycatch quota" available to go along with its target species quota, then it is in each vessel's best interest to fish as cleanly as possible. In the 70's and 80's, the foreign trawl fleets in the North Pacific had exactly that situation with harvest quotas, and a bycatch cap along with it, given annually, company by company . They were able to reduce their bycatch to low enough levels not only to fish their quota but also to allow for unprecedented growth in the halibut stocks.

11 - What about "high-grading" under an ITQ regime? Is this a greater problem with ITQ systems than in an open-access fishery?

The potential for "high-grading" exists with IFQs but no worse than it already exists in any open-access trip-limit fishery. A solution to the problem is simply to require retention of all fish of legal size for which a vessel has ITQs and to have a reasonable level of observer coverage. I believe that as the Canadians have shown with the enforcement of their system, so will it be with most any other system -- as long as the fleet thinks the system is working, we will do our best to enforce the rules ourselves. Our best interest is thus served much more than it is served by doing the same under open-access. Under the latter, no tangible rewards are given for following the rules except for <u>not</u> being penalized. Under ITQs, breaking the rules is a direct infringement on each vessel's future quota. Under ITQs, following the rules and seeing that others do the same gives each vessel a <u>tangible</u> return.

ALL WITNESSES RE: CRITICISMS OF ITQS

12 - In recent U.S. experience, what have been the more common criticisms of proposed ITQ regimes? How have these criticisms been addressed?

The most common criticism of ITQs is that they prevent new entry into the fishery. I disagree heartily. Open-access is currently preventing new entry into the halibut and sablefish fisheries on a sustained, professional level because the fisheries are so degraded that no one dares to invest in them. Anyone who is serious about longlining has no opportunity now. A reasonable and stable fishery that requires an entry fee (and later gives that entry fee back when that person sells their quota) is highly preferable to a fishery with no future and a policy of open entry.

Another criticism is that we will eliminate jobs with ITQs -- only half-true. With IFQs we establish a mechanism with which to find a reasonable level of jobs that can be supported by our fisheries resources. What we have now is over-employment for a short time and unemployment for a long time, each and every year. The return per person is low and the cost to the country in unemployment benefits is high. If we are eliminating any jobs, they are not realistically sustainable jobs nor the kind of jobs with which a person can support a family.

ALL WITNESSES RE: ENFORCEMENT

13 - How do data requirements for managing fisheries with ITQs compare to more traditional management regimes? How much does this contribute to cost savings or increased expense?

Delivery reports of ITQ catch will be more essential on a boat-by-boat basis than they are now. We still will have to keep track of the total catch of the fleet; and, we also will have to track each vessel's production throughout the season. Undoubtedly, this will be more expensive than the system we have now. But, the current need of the Coast Guard to physically monitor the grounds before and after each opening will be virtually eliminated and will offset much of that expense. A small percentage of each vessel's delivery could be used to cover that cost of monitoring deliveries and data collection.

ALL WITNESSES RE: LOST JOBS

14 - What has been the impact of ITQ systems on jobs and harvester income? What can be anticipated for other fisheries proposed for ITQ systems?

In British Columbia, the income levels have risen. Some percentage fewer fishermen are working, but their incomes are better, and more stable, and their working conditions have improved significantly. I expect than an almost identical change will occur in the North Pacific halibut and sablefish fisheries, as well as in the trawl and crab fisheries in that area.

MARK LUNDSTEN

15 - What is the most fair way to assess quotas based on historic

fishing activity? Would it be fair to identify a point in the past before overcapitalization (perhaps January 1, 1989) and grant quota only to those who were participants at that time?

The most fair way to assess quotas is by historic fishing activity. Those who pioneered and developed a fishery are the ones who made the opportunity available for others to come later. They were the ones who developed the technology and the markets, the ones who built up the network of suppliers and buyers. That effort and that risk both should be recognized.

On the other hand, I don't think it is fair to establish a cut-off point too far in the past after which no credit for ITQs should be given. All those later vessels were playing by the rules, just or unjust as they may seem to anyone, and should not be penalized now for that. They simply should not be given the credit that vessels with long history should receive. 1989 is too far in the past to be fair in my opinion. 1992 is much more reasonable.

TESTIMONY OF THORN SMITH

INDIVIDUAL TRANSFERABLE QUOTAS

FEBRUARY 9, 1994

QUOTA ALLOCATIONS

Q: How do you believe quotas should be allocated and further how do we address the concern that current ITQ allocations amount to a federal give-away?

A: If quotas are allocated, they should be allocated only on very recent history, and only to recipients who have demonstrated an intent and an ability to reduce bycatch to acceptable levels. As any economist will tell you, the current disposition of resources in our industry is the result of contemporary market forces and management policies. Any attempt to throw the industry backwards by awarding quotas to past participants is nonsensical, wasteful, and diseconomic. The Magnuson Act encourages both harvesting and processing - those who do both should get priority.

It is difficult but necessary to address the concern that current ITQ allocations amount to a federal give-away. At the recent hearing on the subject, witnesses testified that current ITQ allocations do amount to a federal give-away. Editorial writers and others who look at our circumstance suggest that there should not be a give-away, but that any initial distribution should be by auction - letting the market determine what rents should accrue to the public. They further suggest the auctioning of temporary rights to fish, only - so the public can recieve rents over time as determined by the market. Our association does not favor auctions. We think any Council desiging an ITQ plan should come to grips with the question of public ownership, and design a program of compensation that industry can support.

Q. In offshore oil exploration, the privilege to use the resources is awarded through an auction. Is this an appropriate method to distribute ITQ's?

A. Please see previous answer.

Q. Do you agree with Mark Lundsten's testimony that "there is no right to compensation to (quota) holders in the event the system is changed or revoked."

A. Recipients of quota share may rely on an ITQ system to their detriment by investing to harvest quota (buy a boat, for example), or may purchase quota shares from

others. Either could give rise to a colorable claim for compensation on termination of an ITQ program. A more important consideration, however, is politics. ITQ holders will likely develop such a strong lobby that the question of termination will never arise. A strong industry lobby has reportedly developed in New Zealand under their ITQ program.

MONOPOLIZATION

Q. Do ITQ's promote "big business" as large companies have resources to buy or lease a significant amount of shares.

A. Yes. A primary concern of our organization is that under formulas now being considered, none of us will receive enough ITQ to continue operating. We will be forced to purchase more ITQ shares on the open market if we want to stay in business. We are concerned that large companies will outbid us, and force us out of business. The best way to examine this thesis is to obtain and examine all documentation relating to the NMFS report, **Review of the Effectiveness or Our Administrative and Enforcement Obligaitons under the Surf Clam/Quahog ITQ Plan** (February 25, 1992). This plan was widely touted as a "test" of ITQ's. It has been alleged that there was considerable consolidation of shares in the hands of large corporations, both foreign and domestic. The public should see this material.

Q. What, if anything, should be done to preserve small, traditional fishing communities and prevent "big business" from controlling an ITQ fishery?

A. The most obvious answer is, don't develop an ITQ program in the first place. Alternatively, a strict cap on ownership might be established. Prohibitions of transfer of ITQ shares among vessel size classes has been suggested. There may be other approaches.

Q. How might ITQ's be structured so as not to contribute to increasing monopolization and concentration of ownership of fishing rights? How might the unacceptable concentration of ownership be determined for any fishery?

A: Please see preceding answer. If traditional participants are forced out of a fishery against their will, that might indicate unacceptable concentration of ownership.

Q: If Magnuson was amended to allow collection of revenues in excess of administrative costs, would auction of quota share be a preferred option? Under what circumstances should revenues from an ITQ program be used to finance a

buyout option for compensating those who are forced to leave a fishery?

A. Many think that auction of quota shares is the most logical option, allowing the marketplace to determine what rents should accrue to the public. We do not prefer it. A buyout option for compensating those who are forced to leave a fishery is a good idea under any circumstance.

TRANSFERABILITY

Q: Is free market transferability of quota shares necessary?

A: Economists argue that it is necessary if all the putative benefits of an ITQ system are to be achieved. Social considerations may dictate otherwise.

ENFORCEMENT

Q: What are the potential enforcement problems with individual quota systems? What is the enforcement experience where these have already been used?

A: High-grading and bootlegging are obvious problems, absent 100%, 24-hour observer coverage. False accounting, quota busting, and systematic fraud are reported in New Zealand. The best way to assess U.S. enforcement experience would be to obtain all of the materials relating to the Surf Clam/Quahog ITQ Plan, above, and to study them.

BYCATCH

Q: What impact do ITQ's have on bycatch? What about "high-grading" under an ITQ regime? Is this a greater problem with ITQ systems than in an open access fishery?

A: Trawl fisheries are often conducted on spawning stocks - it may be expectd that this practice would continue under ITQ's. To the extent that the same fishing practices are used, ITQ's will have no effect on bycatch. Some argue that under ITQ's fishermen will fish at times and in places where bycatch is reduced. We do not have enough domestic experience in this area, but it is reported that the New Zealand program "entirely fails to deal with wider by-catch issues," and that high-grading is a problem.

CRITICISMS OF ITQ'S

Q: In recent U.S. experience, what have been the more common criticisms of proposed ITQ regimes? How have these criticisms been addressed?

A. Most U.S. experience with ITQ's has been in the Surf Clam/Quahog plan. Here there have been allegations of price-fixing, collusion, threats and intimidation, foreign ownership of the resource, concentration and monopolistic control of the industry, disguised ownership of quotas, inadequate enforcement and protection, loss of jobs, vessels and lives. These criticisms have (hopefully) been adressed in the NMFS investigation and report mentioned above - we need to obtain all of those materials.

Q. How do the data requirements for managing fisheries with ITQ's compare to more traditional management regimes? How much does this contribute to cost savings or increased expense?

A: Under an ITQ system, catch and bycatch data collection will have to be strictly monitored and enforced - individual vessels cannot be allowed to exceed their quotas. Such monitoring and enforcement will require more observer coverage, more vessel time, more expense. NMFS has advised that it may be necessary to weigh all fish - this would substantially increase the cost of operations.

LOST JOBS

Q: What has been the impact of ITQ systems on jobs and harvester income? What can be anticipated for other fisheries proposed for ITQ systems?

A: Consolidation under an ITQ system would mean, logically, a net loss of jobs but increased harvester income for those left in the fishery. It is alleged that there has been both loss of jobs and diminished incomes for those remaining in the Surf Clam/Quahog fishery. We should study this fishery and the Sablefish/Halibut ITQ plan carefully before extending ITQ's to other fisheries.

SMITH

Q: As part of your testimony you attach about 100 pages of addendum - in two minutes, please tell me what these addenda demonstrate.

A: One of the packages contains editorial material supporting our testimony, and NMFS documents reflecting the

severity of our bycatch problems in the groundfish fisheries off Alaska. The second contains a synopsis of scientific and academic works address the conservation and economic advantages of longline gear over mobile gear. The third contains materials obtained under a Freedom Of Information request for documents on the Surf Clam/Qauhog ITQ plan - it is noteworthy for the information and materials not released.

Q: One addendum is the Conservation Network agenda. Does this mean your Association supports this agenda?

A. Our materials contain only one part of the Conservation Network's agenda, which addresses bycatch reduction and the use of selective gear. We support that part of the Network's agenda.

Center for Marine Conservation

Roger E. McManus
President

March 21, 1994

The Honorable Thomas J. Manton
Chairman
Subcommittee on Fisheries Management
U.S. House of Representatives
Committee Merchant Marine and Fisheries
Room 1334, Longworth House Office Building
Washington, D.C. 20515-6230

Dear Representative Manton:

Thank you for the additional opportunity to comment on the issue of Individual Transferable Quotas (ITQs) subject to your Subcommittee's hearings on February 9 of this year. We appreciate the work of the Subcommittee on this important matter.

I would like to take this opportunity to preface our response to the questions posed in your February 24 letter by addressing some concerns regarding the Subcommittee's hearing. I have not seen the transcript nor written copies of statements by the Members, so I ask for understanding if my recollections are not accurate. I understood several of the Members to say that they were most concerned that the implementation of ITQ systems not result in a reduction in the number of their constituents who are allowed to participate in their fisheries.

There is, of course, considerable irony in this perspective as the primary purpose for ITQ systems originally was as a means to reduce effort. If ITQs are not used to reduce effort, i.e. the number of people fishing in a fishery, then their sole remaining purpose is as an allocation tool. And, as you are well aware, there is considerable debate about fairness and policy regarding allocations with or without ITQs. But, if effort is not limited, overcapitalization will inevitably result with political pressure in increasing catches beyond sustainable levels, as discussed in our publication *Why People Catch Too Many Fish.*

We recognize some have argued ITQs also inherently instill long-term economic views and conservation ethics in participants in fisheries using ITQ systems. These are nice hypotheses, but are offered without any evidence. As noted in my written testimony, even the most highly lauded examples by ITQ proponents cannot be demonstrated to exhibit such characteristics, much less demonstrated to provide for sustainable use. Even in such cases where qualitative information is offered to argue for such characteristics they clearly must be considered on a case by case basis.

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We appreciate, too, that it is harder politically to cut people out of a job completely rather than having them accept a declining percentage of the revenue either by design or default. In all of these cases we essentially are talking about allocation, not fishery management.

But fishery management decisions involve other decisions much more important to ensuring the resource is being managed sustainably. In the list of questions for which you have asked for responses, not one addresses how ITQs will benefit, detract or have a neutral effect on the goal of managing the target species sustainably. This is understandable as this issue is rarely raised in the ongoing debate over ITQs, but is not the question of how we stop the decline of our fisheries central to the debate of what we should do to improve the FCMA and Federal fishing policy? Some of the decisions critical to that concern follow.

1) How much fish shall we allow to be taken i.e., the total allowable catch (TAC)? This needs to be determined whether or not ITQs are going to be allocated. Currently the FCMA allows this number to be established in light of economic and political considerations. The result is that TACs are set too high, fish are "mined" unsustainably rather than being managed for sustainable use. The result is people suffer and lose their jobs. Unfortunately the evidence for imprudent public policy allowing for unsustainable use is abundant.

The Center and other conservation organizations are asking Congress to amend the FCMA to make the Councils establish TACs, determined solely on biological information, with the view that stocks be managed for sustainable use. If such numbers occasionally are too conservative, then stocks will usually be more valuable in the future than less so as is the case now.

2) How to limit the effort to ensure that catches do not exceed the TACs? This is the decision in which ITQs may most likely be useful, but only after realistic TACs have been established. Again we can limit effort by limiting the number of people or their efficiency.

3) How to enforce controls to ensure effort is limited as designed and catches do not exceed the TACs? Obviously this decision should include how best to achieve voluntary compliance without the need to threaten enforcement action.

The Center for Marine Conservation supports the use of ITQs as one management tool available to fishery managers. Considerations for using this tool are further explored in our recent publication with World Wildlife Fund U.S., *Limiting Access to Marine Fisheries: Keeping the Focus on Conservation*. While some suggest ITQ's are the best hope for fisheries management reform, we believe their application and potential is vastly overrated by their proponents and detract from the more fundamental problems of establishing standards and procedures for determining biologically sustainable TACs, providing management

systems to control effort to ensure catches don't exceed those TACs, and enforcing those management procedures. The fact that the debate concerning ITQs virtually ignores questions of sustainability of target species emphasizes this concern.

We believe that the FCMA and the current procedures for considering when to use ITQs are largely sufficient and responsible for this task with a few specific needs for amendment to the Act. Among these we believe Congress should first endorse the Clinton Administration's policy, articulated by NOAA Undersecretary Jim Baker in a January 24, 1994 letter to me, that ITQs "do not confer private property rights, nor do holders of quota shares own the resource." I would add that this issue is particularly important because increasingly knowledge of marine resource conservation and management emphasizes the need to consider interrelationships between target and other species and their ecosystems. Private property rights as well as privileges tantamount to private property rights for marine resources make a frightening specter regarding conservation and sustainable management for these resources. Congress could circumvent predictable, costly litigation by making this policy point clear now.

Beyond this clarification the only amendment we would seek for the FCMA regarding ITQs is to provide NOAA with authority to charge fees for ITQ allocations and for fish landings. For too long the fishing industry has remained unique as the only such industry dependent on public resources that does not provide some compensation to the public for its property and the management of resources relied on by the industry. Fiscal prudence and the need that such funds be provided for needed fishery research and management expenses argues strongly for such authority.

We do not support new, statutorily required standards or procedures for reviewing the application of ITQs. Existing FCMA procedures and those of the National Environmental Policy Act are sufficient to provide for adequate review, and Congressional and public oversight. The FCMA now is characterized by complex, inefficient, and ineffective management regimes; we need to simplify and clarify the law, not further festoon it with additional process mechanisms.

After that lengthy introduction, we would now like to offer our comments on the questions posed in your February 24 letter. We preface those responses, however, by again emphasizing that the questions largely address allocation issues which are largely those of social policy not of how to best ensure that fish stocks are maintained sustainably. It is the latter issue that is of the greatest concern to the Center, the former are largely political decisions.

How do you believe quotas should be allocated and further how do we address the concern that current ITQ allocations amount to a federal give-away?

First, we believe that Congress should authorize NOAA to collect fees for allocation of ITQs as well as for landings. Those fees should be established to reflect the value of the resource harvested, the costs of research for establishing the TACs for the target species, and the costs for managing the fishery. Through such fees the full costs of utilization of the resource and the means to properly manage it are most likely to be ensured.

In offshore oil exploration, the privilege to use the resources is awarded through an auction. Is this an appropriate method to distribute ITQs?

This would arguably be the most economic approach and would probably minimize the number of individuals in the fishery making enforcement and management easier in some respects. Nevertheless, social considerations, such as long participation in the fishery will certainly be argued as legitimate standards for selecting those eligible for ITQ allocations. This is a political call. Nevertheless, we believe every recipient of an ITQ should pay the fair market privilege for the guaranteed access.

Do you agree with Mark Lundsten's testimony that "there is no right to compensation to [quota] holders in the event the system is changed or revoked.

That is the Clinton Administration's policy and we subscribe to it enthusiastically. To do otherwise is tantamount to granting property rights to public marine fisheries and we are unalterably opposed to such policy. Participants in ITQ systems must be prepared for the fact that their shares may change in value because of needed changes to the TACs and if the system is not successfully managing the resource at a sustained level they must accept that it will be changed or revoked. Otherwise one would be arguing that the public should compensate a user of public resources when the management regime must be changed to ensure sustainable use of those resources.

Do ITQs promote "big business" as large companies have resources to buy or lease a significant amount of shares?

This will probably be the case unless there is a cap on the percentage or quantity of shares that can be held by any one person. Again, when NOAA elects to adopt such limitations this is an exercise in social policy which will probably have to be addressed on a case by case basis for which few general rules can be anticipated.

What, if anything, should be done to preserve small, traditional fishing communities and prevent "big business" from controlling an ITQ fishery?

Personally I would hate to see individual fishers and small fishing communities go the way of small farms. The reasons this happens are economic forces taking their normal course. If

Congress wants to preserve small fishers and their communities, Congress can prescribe controls to help ensure that policy - such as caps on percentages of ITQ that can be held by any one person. Personally I also subscribe to the view that government policies essentially promoting mining public fishery resources have led to the collapse of many such resources, causing suffering in communities that were dependent on them so I don't object to government programs to assist such communities through transitions necessitated by the destruction of the resources.

How might ITQs be structured so as not to contribute to increasing monopolization and concentration of ownership of fishing rights? How might the unacceptable concentration of ownership be determined for any fishery?

With regard to the first question the answer again probably lies in limiting the percentage or quantity of ITQs any one person may hold. With regard to the second question, there is, of course, no magic formula. The politically acceptable answer will differ with many different factors such as the nature of the fishery and the history of its implementation.

How do data requirements for managing fisheries with ITQs compare to more traditional management regimes? How much does this contribute to cost savings or increased expense?

As noted above, no matter what management regime one imposes there will still need to be sufficient research to establish biologically sustainable TACs. Management through ITQs or other means will vary in expense on a case by case basis. Certainly the complexity of ITQ systems adds to their expense, but other management regimes for limiting effort could be very expensive as well. NOAA will have to evaluate the merits of ITQ systems, including the acceptability of their expense, on a case by case basis.

What has been the impact of ITQ systems on jobs and harvester income? What can be anticipated for other fisheries proposed for ITQ systems?

We have not conducted research to answer these questions authoritatively. The theory of course is that by limiting access the remaining participants in the fishery will make better living. Those who do not get the ITQs lose access, jobs and income. The upside is that if effort is truly limited and controlled there is a better chance to ensure biologically sustainable TACs will not be exceeded and the fishery can be managed sustainably.

Questions on Amendment Nine to the Surf Clam and Ocean Quahog Management Plan?

We have not examined this fishery sufficiently to offer responses to the questions posed, except to note the complexity of the system and the debate, the cost and dubious value of this ITQ system intended to improve this fishery's management.

Again we appreciate the opportunity to provide our views to the Subcommittee. In summary we would urge the Congress to improve Federal policy by confirming Clinton Administration policy regarding the privatization of public marine resources and by amending the FCMA to provide NOAA with authority to levy fees for ITQs and landings. The conditions under which ITQs may or may not be successful will vary considerably with each fishery and situation for which they are being considered. We do not believe such deliberations will be facilitated by statutorily mandated standards or processes.

Finally, we believe that issues relating to the failure to ensure political will for establishing biologically sustainable TACs and supportive management and enforcement commitments are much more deserving of the considerable attention now given to ITQs, whose promotion exceeds demonstrated potential or probable possibility.

Sincerely,

Roger McManus

Roger E. McManus

ANSWERS TO QUESTIONS ON INDIVIDUAL TRANSFERABLE QUOTAS FOR FISH HARVEST PRIVILEGES RAISED BY THE HOUSE SUBCOMMITTEE ON FISHERIES MANAGEMENT

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March 15, 1994

1. How do you believe quotas should be allocated and further, how do we address the concern that current ITQ allocations amount to a federal give-away?

EDF believes that national guidelines are needed to establish broad principles for allocation and for compensation of the public. Specific initial allocation formulas and compensation mechanisms, however, should be developed on a fishery-by-fishery basis to account for differing community values, differing visions for the future, and other distinctive features of each fishery. Initial allocation is likely to be a contentious process, but no more so than the annual allocation battles that currently consume the majority of the Councils' time and energies. Moreover, under ITQ management the battle would be fought only once instead of every year. The potential for national guidelines to constrain inital allocation debates and thereby alleviate conflicts should be investigated.

We believe that the public will be compensated for granting exclusive harvest rights associated with ITQs in part with greatly improved fisheries management resulting in

sustainable fisheries. However, we also believe that some portion of the economic rent generated by fisheries under ITQ management should be collected and used to fund necessary research, administration, and proactive management. We support an amendment to the Magnuson Act that would remove the current prohibition on the collection of fees or assessments beyond certain limited administrative costs.

The public, through the government, retains the right to revoke quota shares granted under ITQ management, reduce quota shares, and the right to terminate ITQ programs. If these terms are made explicit and clear before ITQ implementation, no compensable takings claims are likely, and none would be successful. Experience with revocable oil and gas leases and grazing permits support this conclusion.

2. In offshore oil exploration, the privilege to use the resources is awarded through an auction. Is this an appropriate method to distribute ITQs?

Oil exploration privileges should be viewed somewhat differently from fish harvest privileges. Only irrevocable oil and gas leases are considered compensable interests, not revocable or conditional leases. Grazing permits may provide a closer analogy to ITQs, since they are both defined to be revocable and by their terms do not create a compensable property right interest.

Auctions of quota shares (QS) for fish harvest privileges would provide an opportunity to minimize conflicts over the initial allocation (which have consumed an enormous amount of time and energy in previous efforts to develop ITQ programs) and at the same time capture some portion of the economic rent (i.e., the difference in the value of the fishery and the costs to exploit it) expected to accrue as a result of improved fisheries management so as to reimburse the public for the granting of exclusive harvest rights. Depending upon the type of auction, all of the economic rent may not be captured due to uncertainties about the tenure of QS, lack of appreciation of the full value of ITQs, and lack of familiarity with ITQs.

Auctions may have dramatic impacts on the structure of the fishery, however, and may not reward the "sweat equity" and capital invested in the fishery by fishermen who have not accumulated enough capital, or who do not have access to adequate capital, to bid successfully for QS. One of the attractive features of ITQs that are allocated on the basis of catch history or other parameters, rather than auction, is the fact that it affords quota holders the flexibility to decide whether to stay in the fishery or to invest the wealth represented by the QS in some other venture.

Other mechanisms to collect rent, such as an assessment on first sale or transfer fees, also fail to capture all of the rent. These latter mechanisms are less desirable than auctions because they would be expected to inhibit trading in QS, and hence might reduce the efficacy with which ITQ management could reduce excess fishing capacity, the key to the success of ITQ management.

Some combination of a non-auction initial allocation formula and ad valorem assessment scheme might best preserve the structure of a fishery while at the same time collecting economic rent and minimizing the impact of rent collection on QS trading. For example, some portion of the total allowable catch (TAC) could be allocated on the basis of catch history, the degree of selectivity of fishing practices and gear types, and other parameters agreed upon by managers and fishermen. Alternatively, "lifeline" quotas (i.e., equal shares of the TAC) could be allocated, while another portion could be auctioned. In either case, an ad valorem tax could be assessed after the full market value of QS becomes clearer to cover administrative, enforcement, research, and other important fisheries-specific activies.

3. Do you agree with Mark Lundsten's testimony that "there is no right to compensation to [quota] holders in the event the system is changed or revoked"?

Yes. Our legal analysis indicates that Constitutional takings claims for compensation would be evaluated on the basis of the expectations of the quota holder. If an ITQ program explicitly states from its inception that QS is subject to loss in value as the result of a reduction of TAC, that QS could be revoked under certain circumstances or modifications of the program, and that the ITQ program as a whole could be terminated at the discretion of the government, then Constitutional takings claims would be unsuccessful.

4. Do ITQs promote "big business" as large companies have resources to buy or lease a significant amount of shares?

The evidence that ITQs promote concentration of market share is mixed, probably because fishery-specific characteristics determine whether concentration will occur and if it does, the degree of concentration. For example, concentration in the surf clam and Canadian offshore groundfish fisheries was a result of large initial shares based on concentration that occurred previous to the implementation of ITQs. Economies of scale, the fact that large specialized tuna boats had few alternate uses, and the availability of capital based on equity accrued in these vessels led to concentration in the Southern Bluefin Tuna fishery in Australia.

When ITQs are expected to result in a undesirable degree or rate of consolidation, measures such as accumulation caps can be used. Rapid consolidation of fisheries in southern Australia and New Zealand was countered by an accumulation cap. Existing anti-trust laws can also be used in the absence of explicit caps on ownership to prevent excessive concentration.

ITQs can favor smaller operators who can take advantage of the increased flexibility afforded by ITQ management. For example, ITQs helped small operators in Australia who were better able to change their operations and marketing strategies than larger firms. Small firms were also able to borrow against their QS, increasing the

availability of capital to them.

5. What, if anything, should be done to preserve small, traditional fishing communities and prevent "big business" from controlling an ITQ fishery?

and

6. How might ITQs be structured so as not to contribute to increasing monopolization and concentration of ownership of fishing rights? How might the unacceptable concentration of ownership be determined for any fishery?

First, it should not be assumed that ITQ management will necessarily result in a dramatic shift from small independent operators to large firms. ITQs could provide an advantage to smaller operators under some circumstances, as discussed above. In addition, individual highliners who receive large amounts of QS in the initial allocation may be the major accumulators of QS, rather than large firms.

If economies of scale and other fishery-specific characteristics are such that large firms would be expected to accumulate an unacceptably large share of the TAC as a result of ITQ management, and if the community places a high priority on the preservation of small, independent fishermen, fishery managers and others could take steps to prevent or limit the accumulation of QS by large firms. These steps could include placing limits on the amount of QS that could be accumulated by an individual or corporation and lawsuits based on anti-trust law.

Managers, fishermen, and community interests should judiciously weigh the benefits of concentration caps against the costs of such measures in terms of their potential to reduce the efficacy of excess fishing capacity reduction.

7. If Magnuson was amended to allow collection of revenues in excess of administration costs, would auction of quota shares be a preferred option? Under what circumstances should revenues from an ITQ program be used to finance a buyout option for compensating those who are forced to leave a fishery?

We have addressed the issue of auctions in our answer to question 2.

EDF believes that revenues collected from an ITQ program should probably not be used to finance a supplemental buyout option to compensate those who are forced to leave a fishery. Fishermen who are allocated QS will be provided with some measure of compensation if they sell their QS. Buyouts of fishermen who did not receive QS would require a lengthy and contentious process for determining who is eligible for a buyout.

Revenues from an ITQ program should be used first to cover administrative and

enforcement costs for the ITQ program. Only if excess revenues remain available after covering such needs should they be used to finance an economic assistance program or other high priority activities, such as research. Excess revenues could be used to establish a sustainable economic assistance program for affected communities, instead of a buyout. Funding requirements for economic assistance programs and other secondary needs should be carefully ranked on a fishery-specific basis to determine priorities for funding if revenues in excess of administrative and enforcement costs are available. If revenues from an ITQ program are inadequate to cover such other needs then alternative funding sources should be sought.

8. Is free market transferability of quota shares necessary?

Allocation of individual quotas reduces excess capacity and lessens the race for fish even if QS is not transferable. Transferability accomplishes these goals far more efficiently and also maximizes the economic wealth of the industry (including the amount of the economic rent that can be used to pay for ITQ management).

Within the confines of the initial allocation and enforcement/administration requirements of the program, trading should be as free as possible and pricing should be unregulated. Restrictions on trading and price regulation would be expected to reduce the efficiency with which ITQ management can reduce excess fishing capacity and increase economic rent.

9. What are the potential enforcement problems with ITQ systems? What is the enforcement experience where ITQ systems have already been used?

Many enforcement problems cited as failings of ITQ systems are in fact failings of all fishery managment regimes. They include misreporting landings, bycatch, discards, and highgrading.

ITQ management may create incentives to highgrade when sufficient price differentials exist for different grades of fish; to misreport landings; and to enter into collusion with fish receivers to misreport landings. These incentives may be counterbalanced to some extent by the incentives for stewardship created by ITQs - quota holders have a direct economic stake in the long term productivity of the fish population, whereas open access fishermen do not.

ITQ management does not always create enforcement problems; in fact, it sometimes facilitates enforcement. Certain design features, such as the revocation of QS for gross violations and redistribution to fishermen in compliance, can greatly increase self-regulation and tips which can aid investigations of collusion and other violations. In addition, QS ownership often changes fishermen who once opposed regulations that force inefficiency (such as input controls) into strong advocates for enforcement to protect his or her harvest rights.

ITQ management usually increases the amount of data available on landings (and bycatch, if bycatch species are also managed under an ITQ system), enabling managers and fishermen to avoid exceeding the TAC. TAC overruns dropped very dramatically as a result of the Canadian ITQ program for halibut and sablefish.

The greatly enhanced flexibility afforded by ITQ management can result in markedly better compliance with regulations and better conservation performance. For example, ITQ management of the wreckfish fishery resulted in the flow of harvest rights to more experienced fishermen who had learned to maximize their catch without bouncing heavy gear off the bottom. Bans on this practice had been ineffective prior to ITQ management.

ITQ management may require greater expenditures for enforcement due to the need to keep track of individual quotas and to corroborate landings reports by fishermen with reports by fish receivers. Dockside observers and special investigations are also necessary. Magnetic cards, similar to Automatic Teller Machine cards, can be used to enter landings data into a central database, greatly facilitating record keeping and double-entry accounting. If the Magnuson Act is amended to allow the collection of additional revenues, ITQ management could create a stream of new revenues for enforcement programs that are currently woefully underfunded.

10. What impact do ITQs have on bycatch?

The record on bycatch is mixed for ITQ management. By some accounts in some fisheries, bycatch has increased, and by other accounts, bycatch has decreased. Reduction of bycatch and the creation of incentives to land unavoidable bycatch and account for bycatch mortality in ecosystem management, should be high priorities for all fishery management regimes, including ITQs.

Bycatch survival has increased in some ITQ fisheries because fishermen have more time to carefully handle bycatch. Similarly, ghost fishing by lost gear has decreased in some cases because less gear is lost than in the frenzied derbies that took place prior to ITQ management.

Bycatch and discards could be reduced by adding catch selectivity to the list of factors that determine QS allocation.

11. What about "highgrading" under an ITQ regime? Is this a greater problem with ITQ systems than in an open access fishery?

ITQ management may create incentives to highgrade when significant price differentials exist for different grades of fish. Incentives to highgrade also exist under open access, but are probably weaker than they would be under ITQ management under many circumstances. However, when trip limits are imposed, as is becoming

increasingly common under open access management (in efforts to extend dwindling seasons resulting from the race for fish), very strong incentives for highgrading exist and an extensive amount of highgrading occurs.

Highgrading could possibly be reduced by establishing separate ITQ systems for different grades of fish. This approach was used successfully in the Lake Erie walleye ITQ program.

12. In recent U.S. experience, what have been the more common criticisms of proposed ITQ regimes? How have these criticisms been addressed?

Many of the failings attributed to existing ITQ programs are, in fact, failings of conventional management policies that the ITQ programs were not designed to address. For example, some have attributed the collapse of the New Zealand orange roughy fishery to ITQ management. The collapse was in reality due to the failure to properly assess the population dynamics and true abundance of the orange roughy, which resulted in an excessive TAC. The TAC for orange roughy and other New Zealand species have since been dramatically reduced. Serious problems in the orange roughy ITQ program, such as lawsuits for compensation when managers needed to reduce TAC, resulted from the government's failure to define QS as a proportion of a fluctuating TAC; QS was allocated as absolute amounts of fish instead. Better assessments conducted after the initial allocation indicated that the fish population could not sustain such effectively "guaranteed" catch levels. All subsequent ITQ programs have defined QS as a proportion of TAC to enable managers to adjust TAC if necessary.

Current ITQ programs share some of the failings of conventional management, such as inadequate enforcement, highgrading, and bycatch. We have already discussed these issues in our answers to questions 9, 10, and 11.

One major criticism of ITQ management has been that the allocation of QS without compensation to the public amounts to a giveaway of a public resource. We have addressed this issue in our answers to questions 1 and 2.

Some have expressed concern that ITQ management may not reduce the race for fish because fishermen will also concentrate their fishing at times and in areas where fish densities are high. This has not been the case in practical experience, perhaps because market gluts resulting from such concentration depress the price of fish. While racing sometimes persists early in an ITQ program, it generally stops when quota holders realize the effects of racing on market prices and gain familiarity with the ITQ program.

Another major criticism of ITQs has been that the exclusive harvest privilege they create may form the basis of compensable Constitutional takings claims. Such claims

are unlikely because ITQ programs can be designed to avert expectations of harvest rights in perpetuity. With a properly designed program, the public must retain ownership and control over fisheries, the size of QS will reflect the variability of TAC from season to season, and the government must retain the right to modify or terminate the ITQ program at any time. These provisions are necessary not only to prevent takings claims, but also to protect the fishery. Others have argued that these limitations on the nature of the right created by ITQs eliminate the incentives for stewardship created by ITQs. However, practical experience in the U.S. wreckfish, surf clam, and ocean quahog ITQ programs has shown that quota holders expect a future stream of revenue from their QS despite a recognition that TAC can be reduced and their harvest privileges can be modified or even revoked by the government, indicating that they are vesting in the future. This is evidence that they have a direct economic interest in the long term health of the fishery. In the Australian ITQ program, quota holders have been able to borrow money using their QS as collateral.

Some critics of ITQs are especially concerned about the potential for ITQs to promote concentration of harvest rights within a relatively small number of large firms, thereby changing the nature of fisheries dominated by a large number of small independent operators. We have discussed this issue in our answer to question 4.

13. How do the data requirements for managing fisheries with ITQs compare to more traditional manaement regimes? How much does this contribute to cost savings or increased expense?

In general, ITQ management requires the collection of more data than is the case for conventional management, because both the landings reported by harvesters and the landings received by processers must be tracked and compared. In some cases, the more detailed data gathered under ITQ management has resulted in much higher compliance with the TAC. The use of automated data collection and tracking systems may reduce costs, as discussed in our answer to question 9.

14. What has been the impact of ITQ systems on jobs and harvester income? What can be anticipated for other fisheries proposed for ITQ systems?

First, it must be recognized that massive job loss is occurring right now as a result of overexploitation and open access mismanagement. Therefore, the main issue is to find the least economically painful way to downsize overcapitalized fisheries. Conventional management regimes allow job loss to occur suddenly as a result of allowing too much fishing effort and not accounting sufficiently for scientific uncertainty and natural variations in fish abundance and productivity. Trip limits, enforced inefficiency with input controls, and other drastic measures result in lost jobs with no compensation.

When ITQ management is used to reduce fishing capacity, job loss can be foreseen and planned for. Fishermen who receive QS can choose to remain in the fishery or leave it by selling their QS. Their returns from the sale of QS represent some compensation for their investment in the fishery. As a management option, crew members and fishermen who do not qualify for QS and who cannot afford to buy QS could be compensated through a community-based economic assistance program funded out of revenues collected from quota holders in excess of funds needed to administer and enforce the ITQ program and other sources of revenues if necessary.

ITQ management has the potential to dramatically increase profits for quota holders in several ways. Reduction of excess capital results in a reduction in the unproductive idling of equipment and in excess investment and debt. ITQs allow fishermen the flexibility to fish at a level of effort corresponding to the profit-maximizing level, rather than being forced to fish at higher, less profitable levels by the intense competition engendered by open access. In the British Columbia halibut ITQ program, revenues increased by $4 million in 1991 as a result of ITQ management, translating into $9,200 per vessel. For BC sablefish, total revenues increased by $3.3 million, or $157,000 per vessel.

ITQ management that results in increased profits, greater compliance with TACs, and more sustainable TACs made possible by reduced economic and social pressure resulting from increased stability and profitability can all contribute to the creation of new, more stable jobs in the future. This has been the case in many ITQ programs around the world.

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